

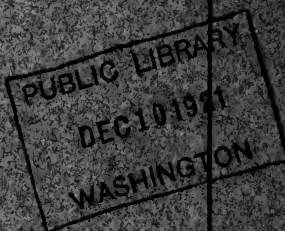
67TH CONGRESS }
2d Session

HOUSE OF REPRESENTATIVES

{ DOCUMENT
No. 236

ANNUAL REPORT OF THE
COMMISSIONERS OF THE
DISTRICT OF COLUMBIA
YEAR ENDED JUNE 30, 1921

Vol. II
ENGINEER DEPARTMENT
REPORTS



WASHINGTON
GOVERNMENT PRINTING OFFICE
1921



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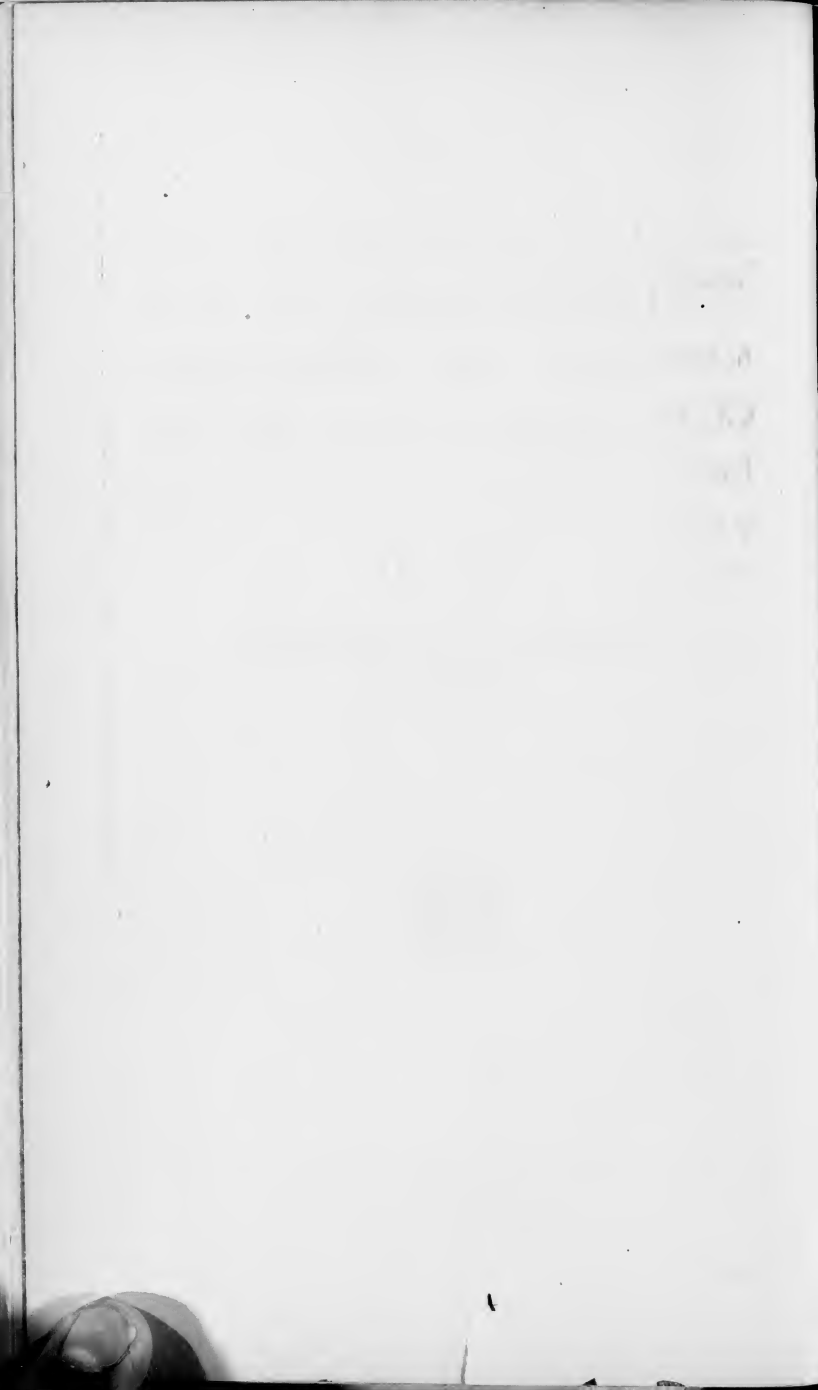


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ORGANIZATION OF THE ENGINEER DEPARTMENT, DISTRICT OF COLUMBIA.

Colonel CHARLES W. KUTZ, *Corps of Engineers, United States Army, Engineer Commissioner.*
Major F. S. BESSON, *Corps of Engineers, United States Army, Assistant.*
Major CAREY H. BROWN, *Corps of Engineers, United States Army, Assistant.*
Captain JOHN E. WOOD, *Corps of Engineers, United States Army, Assistant.*

UNDER THE IMMEDIATE SUPERVISION OF THE ENGINEER COMMISSIONER.

RECORD DIVISION:

ROLAND M. BRENNAN, *Chief Clerk.*

WHARF COMMITTEE:

ROLAND M. BRENNAN, *Chief Clerk, Engineer Department.*

D. E. McCOMB, *Engineer of Bridges.*

RUSSEL DEAN, *Harbor Master.*

DISTRICT BUILDING:

Major F. S. BESSON, *Superintendent.*

UNDER THE IMMEDIATE SUPERVISION OF MAJOR BESSON.

HIGHWAYS (STREETS, ROADS, BRIDGES, ETC.):

C. B. HUNT, *Engineer of Highways.*

J. W. DARE, *Assistant Engineer of Highways.*

Sidewalks and alleys—

H. N. MOSS, *Superintendent of Streets.*

Construction and maintenance of suburban roads—

L. R. GRABILL, *Superintendent of Suburban Roads.*

Construction and care of bridges—

D. E. McCOMB, *Engineer of Bridges.*

Engine Department stables—

BART. J. LYNCH, *Superintendent.*

STREET AND ALLEY CLEANING, COLLECTION OF GARBAGE, ETC.:

MORRIS HACKER, *Supervisor of City Refuse.*

T. L. COSTIGAN, *Superintendent of Street Cleaning.*

ASPHALTS AND CEMENTS:

J. O. HARGROVE, *Inspector of Asphalt and Cements.*

TREES AND PARKINGS:

CLIFFORD LANHAM, *Superintendent of Trees and Parkings.*

MUNICIPAL GARAGE:

E. P. BROOKE, *In charge.*

CHARLES N. EMMONS, *Superintendent.*

UNDER THE IMMEDIATE SUPERVISION OF MAJOR BROWN.

MUNICIPAL ARCHITECT:

ALBERT L. HARRIS.

Repairs to municipal buildings—

HENRY STOREY, *Superintendent of Repairs.*

SURVEYOR'S OFFICE (INCLUDING STREET EXTENSIONS):

M. C. HAZEN, *Surveyor.*

BUILDING INSPECTION:

JOHN P. HEALY, *Inspector of Buildings.*

Plumbing plans and inspection—

A. R. MCGONEGAL, *Inspector of Plumbing.*

Permits, Engineer Department—

H. M. WOODWARD, *Permit Clerk.*

Plumbing board—

P. C. SCHAEFER.

J. S. O'HAGAN.

SAMUEL TAPP.

Board of examiners of steam engineers—

E. F. VERMILLION.

H. BOESCH.

W. I. EVANS.

BOARD FOR CONDEMNATION OF INSANITARY BUILDINGS:

Major CAREY H. BROWN, *Assistant to Engineer Commissioner.*

Dr. W. C. FOWLER, *Health Officer.*

JOHN P. HEALY, *Inspector of Buildings.*

UNDER THE IMMEDIATE SUPERVISION OF CAPTAIN WOOD

WATER DEPARTMENT:

J. S. GARLAND, *Superintendent.*

Water rates—

G. W. WALLACE, *Water Registrar.*

SEWER CONSTRUCTION AND MAINTENANCE:

ASA E. PHILLIPS, *Sanitary Engineer.*

ELECTRICAL DEPARTMENT:

WARREN B. HADLEY, *Electrical Engineer.*

EXTRACT FROM REPORT OF THE COMMISSIONERS OF THE DISTRICT OF COLUMBIA FOR THE FISCAL YEAR ENDED JUNE 30, 1921.

OFFICE OF THE COMMISSIONERS
OF THE DISTRICT OF COLUMBIA,
Washington, October 1, 1921.

To the Senate and House of Representatives of the United States of America in Congress assembled:

The Commissioners of the District of Columbia herewith submit for the information of Congress, pursuant to the requirements of section 12 of an act providing a permanent form of government for the District of Columbia, approved June 11, 1878 (20 U. S. Stats., 108), a report of the official doings of that government for the fiscal year ended June 30, 1921.

* * * * *

ROADWAY PAVEMENTS.

The accompanying table shows the area, in square yards, of new roadway pavements laid and old roadway pavements resurfaced during the year, with the totals in square yards and miles of the various kinds of pavements at the close of the fiscal year.

Comparative statement showing character and extent of roadway pavements.

	Existing amount on June 30, 1920.		New pavement laid dur- ing year, square yards.	Replaced with asphalt.	Existing amount on June 30, 1921.	
	Square yards.	Miles.			Square yards.	Miles.
Sheet asphalt and coal tar.....	3, 253, 588	172. 82	124, 035	.....	3, 377, 623	179. 98
Asphalt block.....	630, 050	32. 02	.....	4, 377	625, 673	31. 74
Durax block.....	12, 294	.30	5, 674	.....	17, 968	.57
Asphaltic or bituminous concrete:						
On concrete base.....	78, 708	4. 58	.....	.....	78, 708	4. 58
On broken-stone base.....	51, 088	2. 68	.....	.....	51, 088	2. 68
Cement concrete.....	222, 123	11. 82	41, 352	13, 257	250, 218	13. 45
Granite block and rubble.....	386, 664	21. 13	.....	1 29, 068	357, 596	19. 59
Witrified block.....	17, 390	1. 04	.....	.....	17, 390	1. 04
Cobble.....	54, 646	2. 73	.....	2 17, 590	37, 056	1. 56
Macadam (estimated).....	1, 954, 556	125. 29	3, 600	3 75, 597	1, 882, 559	120. 85
Gravel and unimproved (traveled).....	.....	147. 72	.....	.....	.....	148. 88
Gutters on asphalt streets.....	232, 237	.....	6, 258	.....	238, 495	.....
Pavements maintained by street rail- ways.....	564, 525	.....	.....	.....	564, 525	.....
Gutters on asphaltic concrete streets.....	11, 201	.....	.....	.....	11, 201	.....
Total.....	7, 469, 070	522, 13	180, 919	139, 889	7, 510, 100	524. 92

¹ Includes 5,674 square yards replaced with Durax.

² Includes 2,176 square yards replaced with concrete.

³ Includes 11,451 square yards replaced with concrete.

NOTE.—51,448.79 square yards sheet-asphalt and coal-tar pavements replaced, including 28,647.41 square yards asphalt surface on old base.

The sums appropriated for expenditures during the year under this head were as follows:

For repairing old roadway pavements, including asphalt resurfacing.....	\$575,000
For paving new roadways.....	569,200
For repair of suburban roads.....	250,000
For grading streets, alleys, and roads.....	30,000

The cost of work showed but slight recessions. Toward the end of the year the tendency was rather markedly downward, but the greater portion of the work had been, of necessity, committed to contract obligations at prices little better than the recent past. Labor morale was continuously improved, and difficulty in securing construction material practically disappeared. For the first time the procedure was followed of surfacing with sheet asphalt concrete roadways laid in past years whose surface conditions, due to use, justified the treatment. All our concrete roadways are constructed in anticipation of such treatment and on grades that allow for it. Four such streets were surfaced and the results were entirely satisfactory.

The prices paid under contracts for roadway pavements during the year were as follows:

	Per square yard.
Laying sheet-asphalt pavement (2½-inch asphalt surface, 2-inch binder, before compression) with 6-inch concrete base.....	\$3.95, \$3.97
Laying vitrified block with 6-inch concrete base.....	3.58, 3.63
Laying sheet asphalt pavement (2½-inch asphalt surface, 2-inch binder, before compression) with 5-inch concrete base.....	3.75, 3.77
Laying vitrified block with 5-inch concrete base.....	3.38, 3.43
Laying 6-inch concrete roadway.....	2.84

The prices paid for resurfacing and repairing asphalt pavements under one-year contracts which expired June 30, 1921, are as follows:

Laying sheet-asphalt pavement (2½ inch asphalt surface, 2 inch binder, before compression) with 6-inch concrete base, per square yard.....	\$3.90
Laying sheet asphalt surface (2½ inches before compression) per square yard....	1.34
Laying asphalt binder (in connection with resurfacing work) per cubic foot.....	.64
Laying sheet asphalt surface for repairs, etc., within the space required by law to be kept in repair by street-railway companies, per cubic foot.....	1.10
Laying asphalt binder for repairs, etc., within the space required by law to be kept in repair by street-railway companies, per cubic foot.....	.90

SUBURBAN STREETS AND ROADS.

A notable item in the year's work was the grading of Connecticut Avenue between Pierce Mill Road and Chappell Road, the grade having been widened on both sides sufficiently to permit the construction of footwalks and setting trees.

The suburban highways on which asphalt roadways were paved were Connecticut Avenue, 1 mile, and Nichols Avenue, one-half mile. The roadways of Bowen Road and Bladensburg Road, for which special appropriations of \$21,000 and \$51,000, respectively, were available, were surfaced with bituminous macadam by day labor after efforts to secure bids for the work within the funds appropriated had failed.

All the concrete roadways which were authorized by appropriation were laid under contract at prices somewhat lower than those of last year. Our heavily traveled suburban thoroughfares should be paved with sheet asphalt on a concrete base as rapidly as funds can be secured in the interest of economy and of public convenience and comfort.

MUNICIPAL ASPHALT PLANT.

The District of Columbia has operated a portable municipal asphalt plant in the repair of asphalt pavements and bituminous macadam roadways for the past 10 years. During the year of 1921 the plant was operated for a period of 248 days, with a total output of 215,832 cubic feet of material, or an average daily output of 870 cubic feet. Additional asphalt material for street repairs supplemental to that furnished by the asphalt plant was purchased under contract from the Cranford Paving Co. to the amount of 43,113.2 cubic feet.

The details of the cost of the operation of the plant are contained in the report of the Engineer of Highways. The total cost of minor repairs to sheet asphalt pavements during the year, the same representing the maintenance costs during the year, was \$122,141.83. This cost represented the maintenance of all asphalt streets not under guarantee by contractors, a total yardage of 3,253,588. The cost per square yard per year was therefore about 3.75 cents. The like annual cost for previous years was as follows:

	Cents.		Cents.
1911.....	2.20	1916.....	1.80
1912.....	2.40	1917.....	1.50
1913.....	2.00	1918.....	1.70
1914.....	1.90	1919.....	3.07
1915.....	1.90	1920.....	3.38

The increase of 1919, 1920, and 1921 over that of 1918 is entirely due to increased unit costs of labor and material.

SIDEWALKS AND ALLEYS.

The sum of \$285,000 was appropriated for paving sidewalks and alleys in all parts of the District and the sum of \$20,000 for laying sidewalks and setting curbs around Government buildings, reservations, and parks. Sidewalks are paved with cement concrete under contract. Twenty-three thousand five hundred and two square yards of cement concrete pavement were laid in various alleys.

One-half of the cost of curb, sidewalk, and alley pavement is assessed against the abutting property, except that abutting public buildings and public reservations. The contract price for laying sidewalks during the year was as follows:

For large jobs adjoining paved streets, per square yard.....	\$2.11
For large jobs adjoining unpaved streets and for all small jobs, per square yard.....	2.27

The initiative in the matter of paving sidewalks and alleys is generally left with the owners of the abutting property, the commissioners requiring a majority petition for such work before it is ordered. Exceptions are made, however, in cases where, on account of public danger or other public reasons, the paving is demanded. The law requires the commissioners to advertise for two weeks their intention to lay sidewalks and curbs and to pave alleys and to give a hearing to the property owners affected. The work is ordered subsequent to such hearing when, in the opinion of the commissioners, it is necessary for public health, safety, comfort, and convenience. The demand for this class of construction is constant, and increased appropriations for this work could be advantageously expended.

BRIDGES.

The principal item of work prosecuted by the bridge department during the past fiscal year was the completion of the reconstruction of portion of gravity and reinforced sections of the canal wall under contract with Hyde & Baxter at a cost of \$24,451.31. A recent contract has been awarded to the W. F. Brenizer Co. for the reconstruction of an additional portion of the aforesaid wall and the work thereunder is now in progress. The Highway Bridge across the Potomac River, until recently under the jurisdiction of the Office of Public Buildings and Grounds, was turned over to the superintendence of the District Commissioners on May 1, 1921. One-half of the roadway of the Anacostia Bridge at the foot of Eleventh Street was resurfaced with asphalt by the Cranford Paving Co. under contract.

INSPECTION OF ASPHALTS AND CEMENTS.

In this office are made chemical and physical tests of materials entering into street and road improvements, such as asphalts, hydraulic cements, sands, road oils, etc.; also fuel oils used at the municipal asphalt plant; cements used in sewer and building constructions. Complete tests representing many subdeterminations were made as follows: Asphalt materials, 1,102; oils, 22; sands, 95; stone, 94; pitch, 4; cements, 11,246, representing 112,517 barrels; miscellaneous materials, 725. Total, 13,288.

The samples of asphalts tested represent 1,836 tons of this material of which 1,215 were used by those holding contracts for laying sheet asphalt, 621 tons used in the production of paving materials at the municipal asphalt plant. Of the materials tested there were rejected 1, 337 barrels of cement and 3,140 cubic yards of sand.

SURVEYOR'S OFFICE.

SURVEYS FOR PRIVATE PARTIES.

Under head of work done for private parties there was a vast increase in the number of orders taken for the past year, there being 8,450 orders the past year as compared with 5,795 the preceding year. The total receipts for private work amounted to \$25,355.82.

The last quarter of the past fiscal year shows that it was the largest quarter in the history of the office, the receipts during this period alone amounting to \$8, 828. 90.

A considerable increase in the number of lots surveyed and the number of new lots created by subdivision was noted. There were 3,043 lots surveyed as compared to 2,756 the preceding year. The new lots created by subdivision totaled 2,814 against 1,703 for the preceding year.

A large increase was made in the number of plats for permits, there being 3,427 against 1,937 the preceding year. This increase was made necessary by reason of the zoning regulations.

The large tracts surveyed subdivided and recorded numbered 25 the past fiscal year as compared to 13 for the preceding year.

MISCELLANEOUS WORK AND WORK FOR THE DISTRICT OF COLUMBIA.

The number of plats recorded in connection with condemnations and dedications totaled practically the same as the preceding year, while the total number of plats drawn, including both public and private, was 8,204 the past fiscal year against 5,347 the preceding year.

The total number of surveys, both public and private, was 4,378, as compared to 3,018 the previous year, and the number of reports made to the inspector of buildings based on the location of walls being erected was 1,084 the past year and 1,175 the preceding year.

CONDEMNATION OF STREETS, PARKS, AND ALLEYS.

In connection with this work much detail work is necessary by this office, such as (1) the survey and preparation of plats, descriptions, etc., for the opening, widening, or straightening of any streets or alleys by condemnation, as well as the preparation of all dedication plats, and (2) attendance in court is required of an employee of this office during condemnation proceedings.

Streets and parks.—There are now pending in court 15 street and park cases, and 4 new cases have been ordered by the commissioners but not yet filed. During the past year 8 street and park cases were confirmed.

Alleys.—Five alley cases are now pending in court, with 2 cases ordered by the commissioners but not yet filed, and 11 alley cases were confirmed.

The amount awarded as damages for all condemnation cases during the past year was \$49,465.65.

PARKS.

The original Federal city is famous for its street plan and for its beautiful parks. Outside the original city we have a highway plan for the entire District of Columbia, and all property which is subdivided must conform to this plan. The entire District is therefore being developed in accordance with a comprehensive and orderly street plan, but there is no provision for parks outside the Federal city except such as are acquired from time to time by special acts of Congress. This is usually not done, however, in accordance with any plan that has been adopted. It is true that the McMillan park plan was submitted to Congress in 1902, providing for a plan outside of the cities of Washington and Georgetown, but there was no provision made for executing it, and land is being subdivided and improved with no consideration for this or any other plan. If this condition is permitted to continue over the entire District, many of the beauty spots of the District will be destroyed, and the District will be developed without any provision for parks. Much of this land is sparsely settled, and is comparatively cheap. These beauties should be preserved so that the citizens can walk and ride through them and the children play in the open and breathe the fresh air, to promote the health and happiness of our people. Many magnificent trees and lovely areas are being destroyed by subdivisions and improvements, thus creating the newer Washington without the liberal

park spaces provided in the older city. It is a reflection to say that the original designers of the old Washington showed greater foresight than the designers of the new Washington. These areas should be acquired for the health, recreation, and pleasure of our people.

It is gratifying to note that the committee on streets and parks of the Washington Board of Trade, of which the surveyor is a member, have had introduced in Congress bills providing for Piney Branch Parkway, Klingle Road Valley, and the Patterson tract. The necessity for the acquisition of these parks needs little comment. Their locations are ideal, they are covered with magnificent forest trees, and they are well distributed in different parts of the District. They have previously been approved by the commissioners, and should be included again, with the addition, it is thought, of extending the Fort Drives so as to include the old Civil War forts built for the defense of Washington, two of which have already been acquired, namely, Fort Davis and Fort Dupont.

ALLEYS.

The law which provides for the elimination of alley dwellers was suspended for one year after the ratification of the peace treaty. Since the close of the fiscal year it has become general knowledge that the peace treaty has been signed, and therefore the alley law will soon become effective. It would seem to be highly important that some action should be taken in regard to this law. Now that things are returning to normal, this alley problem as to alley dwellers should be prosecuted vigorously, as many of these alleys are densely crowded, insanitary, and a menace to the health and welfare of the community. They are breeding places for crime, where policemen dare not venture without endangering their lives. They harbor "bootleggers" and criminals of all classes, and on account of their accessibility form splendid hiding places for all who are engaged in the violation of the law.

TREES AND PARKINGS.

The number of trees planted along the curbs in the streets of the District of Columbia at the close of the fiscal year was 105,803, an increase over the preceding year of 404. The amount expended for the planting and care of trees during the year was \$63,489.83.

About one-half of the trees planted were for the purpose of filling vacancies in existing rows in the northeast and southeast sections of the city, and the remainder were used in extending the lines into the suburbs and hitherto unplanted localities.

The nursery at Fort Dupont is well stocked with fine trees. This ground is well adapted for tree-nursery purposes, although there is not enough ground in this tract to grow a sufficient number of trees to keep up with the rapid growth of the city. During the fiscal year 108 pin oak, 874 red oak, 574 elm, 528 Norway maple, and 156 silver maple seedlings were planted in the nursery rows.

The systematic trimming of trees was resumed during the fiscal year, and as a result the dead wood and low limbs were removed from all trees on public space north of the Mall to Florida Avenue and west from Fourth to Eighteenth Streets NW.; also the low limbs were

removed from the trees on all streets north of Florida Avenue and west of North Capitol Street to Rock Creek; all streets in Cleveland Park, Chevy Chase, section east of North Capitol Street and north of Florida Avenue NE., all streets in Twining City, Anacostia, and Congress Heights. The trees in the down-town section of the city are in need of severe trimming, topping off, etc., and it is hoped that this work can be undertaken in the near future. The total number of trees trimmed during the year was 30,801.

STREET AND ALLEY CLEANING AND COLLECTION AND DISPOSAL OF CITY REFUSE.

Two appropriations covered the operations of the city refuse division. One of \$375,000 for dust prevention, cleaning of streets and alleys, and snow removal, and the second of \$750,000 for the collection and disposal of garbage, ashes, and miscellaneous refuse.

As in other branches of the service work was done at a reduced cost over the cost of the last year due to growing labor efficiency particularly noticeable in the latter months of the year.

On account of the mild winter no snow and ice work was necessary.

Sixty thousand and fifty-eight tons of garbage were collected during the year, an amount greater than ever collected before notwithstanding private individuals were permitted throughout the year to collect and transport this material to points outside the District of Columbia to be fed to poultry and pigs. The cost of the municipal collection was \$244,440.56. The revenue from grease and tankage produced from this garbage at the reduction plant was \$155,196.61. The cost of operation of the disposal plant was \$196,162.74. The sum received from grease and tankage is small as compared with the two previous years because of the unprecedentedly low prices prevailing for such products, particularly during the latter portion of the year. Since April the price offered for tankage has not equaled the cost of production and in consequence the press cake has been piled and not sold.

Because of the mild winter there was not the usual production of ashes by householders. One hundred and thirty-three thousand nine hundred and forty cubic yards were collected as compared with 148,228 cubic yards the previous year.

During the past year the District collected the miscellaneous refuse and operated the salvage plant for the contractor who had failed the year before, but whose contract did not terminate until June 30, 1921. The revenue from salvage material amounted to slightly more than the cost of operating the disposal plant.

All of these services are becoming perceptibly more and more costly by reason of the difficulty in securing dumping places for waste material. It is believed the time has come where dumping ground must be acquired outside of the District of Columbia.

In the last three years the District has taken over as municipal functions the garbage, ash, and trash services. To improve these services urgent necessities are: A stable in the suburbs to shorten the haul of horse-drawn vehicles, a stable and wagon sheds to replace the present leased property where the horses used in the ash services are sheltered, a shop where repairs to all the equipment used in the several services would be made, a garage for trucks used in the garbage

service, the overhauling and remodeling of the present garbage-reduction plant, an up-to-date trash plant, with incinerator of large capacity, located in the industrial section along the railroad, and the acquisition of property outside the District of Columbia for dumping purposes.

BUILDING OPERATIONS.

The estimated value of building construction, including repairs, during the year was \$18,999,926, a decrease of \$3,638,936 as compared with the fiscal year 1920.

The number of permits issued was 8,310, an increase of 785 over previous year. This increase, however, was in repairs or alterations, as in 1920 there were erected 741 more new buildings—352 dwellings, 12 apartment houses, 377 business buildings.

A more or less chaotic state still obtains in the building trade; the cost of materials and of labor continues high, and there seems no present indication of normal conditions returning. Activity is becoming more pronounced as the summer progresses, but it probably will be some time before a status of stability shall be gained.

The act to regulate the height, area, and use of buildings, commonly known as the zoning law, was approved March 1, 1920, and the regulations promulgated thereunder became effective August 30, 1920.

During the ensuing 10 months there were issued 4,150 conforming certificates of occupancy and 450 nonconforming certificates, the fees therefor totaling \$2,400.

The wisdom of the zoning law is being convincingly demonstrated almost daily, and not the least gratifying feature connected with its administration has been its general and enthusiastic indorsement by those whose financial interests, primarily at least, were adversely affected.

CONSTRUCTION OF MUNICIPAL BUILDINGS.

During the year nine buildings were under construction, as follows: A four-room addition to the Deanwood School; an eight-room addition to the Petworth School; foundations and substructure for the new Eastern High School; an eight-room addition to the Burrville School; an eight-room building known as the John Burroughs School; an eight-room addition to the Takoma School; an eight-room addition to the Joseph Rodman West School; a girls' cottage at the National Training School for Girls, and the psychopathic group and power house and domestic buildings for the Gallinger Municipal Hospital.

Plans and specifications were completed for a four-room addition to the Henry D. Cooke School, and the contract for the construction of the same, executed June 30, 1921, calls for the completion of this addition in December, 1921. Plans and specifications were completed for the remodeling of the Phelps School, and the contract for this work, executed July 21, 1921, calls for the completion of the same in October, 1921.

Plans and specifications were prepared in this office for 40 improvements to various school buildings, engine houses, and police stations.

REPAIRS TO MUNICIPAL BUILDINGS.

All municipal buildings are kept in repair under the direction of the municipal architect. During the year only such repairs were made as would prevent further deterioration in the structures, as the continuation of high wages and high prices of materials prevented the doing of more extensive repair work with the funds that were available.

The appropriations for repair work and the expenditures of same were as follows:

For repairs to school buildings: Two hundred thousand dollars was appropriated, and all was expended but \$250.25. Requests for repairs submitted by the school authorities amounted to about \$400,000.

Sixteen thousand dollars was appropriated for repairs to engine houses, and all but \$3.52 expended.

Eight thousand dollars was appropriated for repairs to police stations, and all was expended but \$36.33.

Five thousand dollars was appropriated for repairs to the police court building, and all was expended but \$4.45.

In addition to the above, repairs were made on various buildings under the control of the commissioners to the amount of \$65,864.13.

Steam boilers in 89 District buildings were inspected and repaired.

WORKHOUSE AND REFORMATORY.

During the year very extensive repair work was done to the old wooden wharf at the Ninth Street property yard in Washington, and a stretch of the old wharf on Occoquan Creek was rebuilt. The railroad from Occoquan Creek to the commissary was put into excellent condition, and the brick building for a shelter and repair shop for the locomotive was built. The railroad between the reformatory and workhouse was carried across Giles Run, and the Giles Run culvert almost completed. The permanent buildings at the reformatory have progressed steadily. The new brick boiler house and two-family cottage at the workhouse were completed. As usual, extensive and continual repairs were necessary to all of the old wooden buildings at the workhouse.

THE DISTRICT BUILDING.

The routine work incident to the maintenance of the District Building involves several distinct functions, viz., the power plant; woodworking, paint, and electrical shops; blue-print and photo shops; printing shop; and the elevator, watch, and cleaning forces. During the year 2,155 tons of coal were consumed. Eight hundred and ninety cubic yards of ashes were removed, at a cost of \$800. The electric current used by the various departments for purposes other than lighting amounted to 93,514 kilowatts. The print shop completed 358 orders for printing, totaling \$8,101.73, while the blue-print and photographic shop completed 48,582 square feet of blue printing and 1,600 photographs at a total cost of \$3,318.07. There was purchased and installed a Pease blue printer at a cost of \$700. Because of the congestion brought about by the growth of old departments and the creation of new departments additional floor space should be provided, either by making an addition to the District Building or by acquiring adjacent property.

park spaces provided in the older city. It is a reflection to say that the original designers of the old Washington showed greater foresight than the designers of the new Washington. These areas should be acquired for the health, recreation, and pleasure of our people.

It is gratifying to note that the committee on streets and parks of the Washington Board of Trade, of which the surveyor is a member, have had introduced in Congress bills providing for Piney Branch Parkway, Klinge Road Valley, and the Patterson tract. The necessity for the acquisition of these parks needs little comment. Their locations are ideal, they are covered with magnificent forest trees, and they are well distributed in different parts of the District. They have previously been approved by the commissioners, and should be included again, with the addition, it is thought, of extending the Fort Drives so as to include the old Civil War forts built for the defense of Washington, two of which have already been acquired, namely, Fort Davis and Fort Dupont.

ALLEYS.

The law which provides for the elimination of alley dwellers was suspended for one year after the ratification of the peace treaty. Since the close of the fiscal year it has become general knowledge that the peace treaty has been signed, and therefore the alley law will soon become effective. It would seem to be highly important that some action should be taken in regard to this law. Now that things are returning to normal, this alley problem as to alley dwellers should be prosecuted vigorously, as many of these alleys are densely crowded, insanitary, and a menace to the health and welfare of the community. They are breeding places for crime, where policemen dare not venture without endangering their lives. They harbor "bootleggers" and criminals of all classes, and on account of their accessibility form splendid hiding places for all who are engaged in the violation of the law.

TREES AND PARKINGS.

The number of trees planted along the curbs in the streets of the District of Columbia at the close of the fiscal year was 105,803, an increase over the preceding year of 404. The amount expended for the planting and care of trees during the year was \$63,489.83.

About one-half of the trees planted were for the purpose of filling vacancies in existing rows in the northeast and southeast sections of the city, and the remainder were used in extending the lines into the suburbs and hitherto unplanted localities.

The nursery at Fort Dupont is well stocked with fine trees. This ground is well adapted for tree-nursery purposes, although there is not enough ground in this tract to grow a sufficient number of trees to keep up with the rapid growth of the city. During the fiscal year 108 pin oak, 874 red oak, 574 elm, 528 Norway maple, and 156 silver maple seedlings were planted in the nursery rows.

The systematic trimming of trees was resumed during the fiscal year, and as a result the dead wood and low limbs were removed from all trees on public space north of the Mall to Florida Avenue and west from Fourth to Eighteenth Streets NW.; also the low limbs were

removed from the trees on all streets north of Florida Avenue and west of North Capitol Street to Rock Creek; all streets in Cleveland Park, Chevy Chase, section east of North Capitol Street and north of Florida Avenue NE., all streets in Twining City, Anacostia, and Congress Heights. The trees in the down-town section of the city are in need of severe trimming, topping off, etc., and it is hoped that this work can be undertaken in the near future. The total number of trees trimmed during the year was 30,801.

STREET AND ALLEY CLEANING AND COLLECTION AND DISPOSAL OF CITY REFUSE.

Two appropriations covered the operations of the city refuse division. One of \$375,000 for dust prevention, cleaning of streets and alleys, and snow removal, and the second of \$750,000 for the collection and disposal of garbage, ashes, and miscellaneous refuse.

As in other branches of the service work was done at a reduced cost over the cost of the last year due to growing labor efficiency particularly noticeable in the latter months of the year.

On account of the mild winter no snow and ice work was necessary.

Sixty thousand and fifty-eight tons of garbage were collected during the year, an amount greater than ever collected before notwithstanding private individuals were permitted throughout the year to collect and transport this material to points outside the District of Columbia to be fed to poultry and pigs. The cost of the municipal collection was \$244,440.56. The revenue from grease and tankage produced from this garbage at the reduction plant was \$155,196.61. The cost of operation of the disposal plant was \$196,162.74. The sum received from grease and tankage is small as compared with the two previous years because of the unprecedentedly low prices prevailing for such products, particularly during the latter portion of the year. Since April the price offered for tankage has not equaled the cost of production and in consequence the press cake has been piled and not sold.

Because of the mild winter there was not the usual production of ashes by householders. One hundred and thirty-three thousand nine hundred and forty cubic yards were collected as compared with 148,228 cubic yards the previous year.

During the past year the District collected the miscellaneous refuse and operated the salvage plant for the contractor who had failed the year before, but whose contract did not terminate until June 30, 1921. The revenue from salvage material amounted to slightly more than the cost of operating the disposal plant.

All of these services are becoming perceptibly more and more costly by reason of the difficulty in securing dumping places for waste material. It is believed the time has come where dumping ground must be acquired outside of the District of Columbia.

In the last three years the District has taken over as municipal functions the garbage, ash, and trash services. To improve these services urgent necessities are: A stable in the suburbs to shorten the haul of horse-drawn vehicles, a stable and wagon sheds to replace the present leased property where the horses used in the ash services are sheltered, a shop where repairs to all the equipment used in the several services would be made, a garage for trucks used in the garbage

service, the overhauling and remodeling of the present garbage-reduction plant, an up-to-date trash plant, with incinerator of large capacity, located in the industrial section along the railroad, and the acquisition of property outside the District of Columbia for dumping purposes.

BUILDING OPERATIONS.

The estimated value of building construction, including repairs, during the year was \$18,999,926, a decrease of \$3,638,936 as compared with the fiscal year 1920.

The number of permits issued was 8,310, an increase of 785 over previous year. This increase, however, was in repairs or alterations, as in 1920 there were erected 741 more new buildings—352 dwellings, 12 apartment houses, 377 business buildings.

A more or less chaotic state still obtains in the building trade; the cost of materials and of labor continues high, and there seems no present indication of normal conditions returning. Activity is becoming more pronounced as the summer progresses, but it probably will be some time before a status of stability shall be gained.

The act to regulate the height, area, and use of buildings, commonly known as the zoning law, was approved March 1, 1920, and the regulations promulgated thereunder became effective August 30, 1920.

During the ensuing 10 months there were issued 4,150 conforming certificates of occupancy and 450 nonconforming certificates, the fees therefor totaling \$2,400.

The wisdom of the zoning law is being convincingly demonstrated almost daily, and not the least gratifying feature connected with its administration has been its general and enthusiastic indorsement by those whose financial interests, primarily at least, were adversely affected.

CONSTRUCTION OF MUNICIPAL BUILDINGS.

During the year nine buildings were under construction, as follows: A four-room addition to the Deanwood School; an eight-room addition to the Petworth School; foundations and substructure for the new Eastern High School; an eight-room addition to the Burrville School; an eight-room building known as the John Burroughs School; an eight-room addition to the Takoma School; an eight-room addition to the Joseph Rodman West School; a girls' cottage at the National Training School for Girls, and the psychopathic group and power house and domestic buildings for the Gallinger Municipal Hospital.

Plans and specifications were completed for a four-room addition to the Henry D. Cooke School, and the contract for the construction of the same, executed June 30, 1921, calls for the completion of this addition in December, 1921. Plans and specifications were completed for the remodeling of the Phelps School, and the contract for this work, executed July 21, 1921, calls for the completion of the same in October, 1921.

Plans and specifications were prepared in this office for 40 improvements to various school buildings, engine houses, and police stations.

REPAIRS TO MUNICIPAL BUILDINGS.

All municipal buildings are kept in repair under the direction of the municipal architect. During the year only such repairs were made as would prevent further deterioration in the structures, as the continuation of high wages and high prices of materials prevented the doing of more extensive repair work with the funds that were available.

The appropriations for repair work and the expenditures of same were as follows:

For repairs to school buildings: Two hundred thousand dollars was appropriated, and all was expended but \$250.25. Requests for repairs submitted by the school authorities amounted to about \$400,000.

Sixteen thousand dollars was appropriated for repairs to engine houses, and all but \$3.52 expended.

Eight thousand dollars was appropriated for repairs to police stations, and all was expended but \$36.33.

Five thousand dollars was appropriated for repairs to the police court building, and all was expended but \$4.45.

In addition to the above, repairs were made on various buildings under the control of the commissioners to the amount of \$65,864.13.

Steam boilers in 89 District buildings were inspected and repaired.

WORKHOUSE AND REFORMATORY.

During the year very extensive repair work was done to the old wooden wharf at the Ninth Street property yard in Washington, and a stretch of the old wharf on Occoquan Creek was rebuilt. The railroad from Occoquan Creek to the commissary was put into excellent condition, and the brick building for a shelter and repair shop for the locomotive was built. The railroad between the reformatory and workhouse was carried across Giles Run, and the Giles Run culvert almost completed. The permanent buildings at the reformatory have progressed steadily. The new brick boiler house and two-family cottage at the workhouse were completed. As usual, extensive and continual repairs were necessary to all of the old wooden buildings at the workhouse.

THE DISTRICT BUILDING.

The routine work incident to the maintenance of the District Building involves several distinct functions, viz., the power plant; woodworking, paint, and electrical shops; blue-print and photo shops; printing shop; and the elevator, watch, and cleaning forces. During the year 2,155 tons of coal were consumed. Eight hundred and ninety cubic yards of ashes were removed, at a cost of \$800. The electric current used by the various departments for purposes other than lighting amounted to 93,514 kilowatts. The print shop completed 358 orders for printing, totaling \$8,101.73, while the blue-print and photographic shop completed 48,582 square feet of blue printing and 1,600 photographs at a total cost of \$3,318.07. There was purchased and installed a Pease blue printer at a cost of \$700. Because of the congestion brought about by the growth of old departments and the creation of new departments additional floor space should be provided, either by making an addition to the District Building or by acquiring adjacent property.

MUNICIPAL GARAGE.

During the fiscal year ended June 30, 1921, there were maintained and kept in running condition 43 automobiles. The garage was kept open day and night, all machines being washed and supplied with gasoline and oil by the night force, who also served as watchmen. The labor and mechanical force consisted of eight men. Their duties consisted of keeping up the repair work or driving for departments which were without chauffeurs and of carrying the mail from the city post office to the District Building. The total cost of maintenance and repair of the 43 automobiles, including gasoline, oil, miscellaneous supplies, and labor amounted to \$20,200.84, or an average of \$469.78 for each car, or \$0.077 per mile. The total cost of repair parts was \$4,052.13, an average of \$94.23 per car, or an average of \$0.0153 per mile. The average mileage per car was 6,139 miles.

PLUMBING INSPECTION DIVISION.

The plumbing inspector's force made a total of 41,750 inspections during the year, this being an increase of 60 per cent over the number recorded last year. About one-third of this number of inspections was caused by complaints of defective plumbing and drainage. This was an average of nearly 15 inspections per day per man on duty, and the largest number of inspections in any one day was 36.

It is estimated that plumbing construction and repair work in the District of Columbia (not including work done by the United States Government) amounted to about \$2,500,000.

There were 38 cases of violation of law prosecuted in police court, but 1 of which was dismissed. The total amount of fines collected was \$448.

This division handled 181 cases submitted to it by various departments under the nuisance and drainage act, and found it necessary to do the work under the assessment system in only 17 of them.

PLUMBING BOARD.

The plumbing board held 24 meetings and examined 77 candidates, only 13 of whom passed and were recommended for license.

PUBLIC CONVENIENCE STATIONS.

Four convenience stations were open from 6 a. m. until midnight throughout the year and during that time are estimated to have accommodated nearly 11,000,000 persons, the women using the stations about one-eighth as much as the men. The cash receipts for the year, consisting of fees received from the use of pay toilets, rental of clean towels, commission on telephone service, etc., amounted to \$8,882.17.

INSPECTION OF STEAM BOILERS.

The number of steam boilers inspected by the inspector of steam boilers during the year was 476, including 30 belonging to the District of Columbia. Two boilers were condemned as unfit for further use. The compensation of the inspector of steam boilers is paid from fees

collected from owners of the boilers. The total amount of fees reported by that official was \$2,380, and the expense of inspection \$350, leaving a net compensation to him of \$2,030.

EXAMINATION OF STEAM ENGINEERS.

The board of examiners of steam engineers held 52 examinations and examined 168 applicants, of whom 77 were found competent and 91 incompetent.

STREET LIGHTING.

There are 20,342 street lamps of all kinds in the District of Columbia, as follows:

Gas, mantle.....	10,581	
Electric, arc:		
6.6-ampere magnetite.....	282	
4.0-ampere magnetite.....	497	
		779
Electric, incandescent:		
250-candlepower, series.....	14	
200-candlepower, multiple.....	64	
100-candlepower, series.....	4,044	
100-candlepower, multiple.....	98	
60-candlepower, series.....	3,917	
60-candlepower, multiple.....	269	
		8,406
Street designation:		
Gas, 2½-foot, flat flame.....	397	
Electric, 8-candlepower.....	179	
		576
Total.....		20,342

This was a net increase during the year of 342 lamps.

Additions and extensions have necessarily been confined to some of the more pressing demands in newly occupied unlighted streets, in streets and alleys of enlarged occupancy, at special points requiring additional safeguarding of traffic and in connection with certain street improvements, where a deferment of needed changes in lighting would have been an economic waste. Of the 533 lamps newly connected (gross), 322 were either "designation," or the lowest powered gas or electric.

The improved incandescent electric lighting was extended during the year by the installation of 39 lamps, replacing less effective incandescents on Calvert Street and Connecticut Avenue NW. from Calvert Street Bridge to Cathedral Avenue; 32, replacing gas on New Hampshire Avenue NW., from Twenty-seventh Street to Washington Circle; 61, replacing gas on Massachusetts Avenue NW. from Dupont Circle to S Street, including Sheridan Circle; 29, replacing arcs on Louisiana Avenue NW. from Eighth to Tenth Streets; and 9 scattering.

The change of type of glass street designation signs, to improve legibility, has progressed to upward of 40 per cent of completion.

As to the several suits brought by the District of Columbia against certain railroad companies to recover in repayment for sums expended for the lighting of streets, avenues, etc., adjacent to the respective rights of way of such companies, the necessary retrial previously referred to has not been reached and the situation remains essentially as reported a year ago.

SIGNAL SYSTEMS—FIRE ALARM TELEGRAPH, POLICE PATROL SIGNAL,
AND TELEPHONE SERVICE.

There were 714 fire-alarm boxes in service at the end of the year, 613 on underground and 101 on overhead wires, a net increase of 19 over the preceding year; 858 box fire alarms and 916 local alarms were received during the year, of which 112 box and 33 local were false. Additional apparatus for fire-alarm headquarters, under contract, had not been received at the end of the year.

There were 475 police patrol boxes in service at the end of the year, 378 on underground and 97 on overhead wires, an increase of 11 over the preceding year.

There were 1,427 telephones connected to the District system at the end of the year, and 27 in use as portable sets by fire and electrical departments, an increase of 36 in the year.

The number of cells of storage battery in service on fire alarm, police patrol, and local circuits remains unchanged at 2,174.

There were in service on the composite signal systems on June 30, 1921, 163.24 miles of underground cable, containing 6,392.38 miles of conductors and 156.61 miles of aerial conductors, a grand total of 6,549 miles of conductor, a net increase of 32.33 miles of conductor, the amount of aerial conductor remaining unchanged. Certain of the trunk lines are overloaded, reserve capacity below safety requirements and desirable service impossible. Expansion is urgently required.

ELECTRICAL INSPECTION.

The total number of permits issued for installation of wires and apparatus for electric light, heat and power purposes, on private premises, not including distribution or other plant of public service companies, during the year, was 6,217, compared with 6,099 in the preceding year, representing approximately 6,933 kilowatts capacity of utilization equipment. The total amount of fees paid for permits for such installation was \$11,626, compared with \$10,596. The total number of inspections recorded relating to this work, was 16,170, compared with 14,965. These figures all show increase above the preceding year, which latter showed phenomenal increases over the next preceding year. The number of inspectors engaged in this important fire and accident prevention service has remained stationary for many years and an increase is essential to adequate and efficient functioning.

Supervision was exercised over the erection, taking down, moving, replacing, or resetting of an aggregate of 1,353 line and guy poles and of 197 pole guy anchors, and of the stringing of overhead wires in streets and other public spaces. The total of recorded wire-supporting poles in the District at the end of the year was: Line, 18,890; guy, 1,115; total, 20,005, compared with a total of 19,656 at the end of the preceding year, a net increase of 349. The telephone company has increased by 1 the number of its poles in streets within the area prescribed in the act of Congress regulating the use of telephone wires approved June 30, 1902.

The electrical department has cooperated with and assisted the municipal architect and other District officers, consulting and counseling, preparing plans and specifications, and supervising electrical work.

HARBOR FRONT.

The annual rental of wharves on the river frontage placed by law under the control of the commissioners are as follows:

Potomac River front.....	\$18, 618. 60
Anacostia River front.....	400. 00
Total.....	19, 018. 60

The actual water frontage of the District of Columbia devoted to commerce, with the exception of canals, is about 2 miles. The total available water frontage is about 18 miles, of which about 8 miles is set aside for parks and purposes of the United States. The largest amount of wharf property under the control of the commissioners is along the Washington Channel. The total frontage along this channel is 9,275 linear feet, of which 4,675 linear feet between the grounds of the War College and the south curb line of N Street are under the control of the United States. Of the remaining 4,600 linear feet, 4,041 feet are under the jurisdiction of the commissioners and 559 linear feet between Thirteenth and Fourteenth Streets has been designated by Congress as a site of the Federal central heating, lighting, and power plant.

Along the frontage under the control of the commissioners are located the harbor police station and dock, the dock of the fire boat, the District morgue, the municipal fish wharves and market, and the District workhouse and sand wharves. The balance of the frontage is leased to private parties.

CONDEMNATION OF INSANITARY BUILDINGS.

The board for the condemnation of insanitary buildings held 14 meetings and issued orders for the repair of 255 and the demolition of 156 buildings.

Number of buildings demolished located on streets.....	84
Number of buildings demolished located on alleys.....	72
Number of buildings repaired located on streets.....	40
Number of buildings repaired located on alleys.....	24

Since the creation of the board, May 1, 1906, there have been 8,018 examined, of which 2,545 have been demolished and 1,912 repaired. The number of buildings demolished which were located on streets, 1,689; the number of buildings demolished which were located on alleys, 856; number of people required to secure other living quarters through the action of the board during the year ended June 30, 1921, 1,055; number of people benefited by improvements required by the board since its creation, 6,836. Estimated value of repairs made during the year ended June 30, 1921, in response to orders issued by the board, \$81,680.

Attention is invited to the act of Congress relative to the occupancy of alley dwellings.

Number of cases in court, one.

SEWERAGE SYSTEM.

The construction and maintenance of the sewerage system and the sewage disposal system of the District of Columbia is placed under a division in charge of the sanitary engineer, District of Columbia.

The length of main and pipe sewers constructed during the year was 7.57 miles. The total length of main and pipe sewers on June 30, 1921, was 753.88 miles, of which 150.84 miles are main sewers and 603.04 miles are pipe sewers. There was expended during the year on the sewerage system the sum of \$475,038.68, and on the sewage disposal system \$51,377.25. The total cost of the sewerage system to June 30, 1921, was \$15,101,797.68. The total cost of the sewage disposal system to the same date was \$5,970,347.25, making a total cost of the complete system to June 30, 1921, \$21,072,144.93.

SEWAGE DISPOSAL SYSTEM.

The main sewage pumping station was in continuous operation throughout the year, handling the sewage of practically the entire District and also the storm water from the 900-acre low area within the dike lines. At the main pumping station sewage to the amount of 25,000,000,000 gallons and 424,000,000 gallons of storm water were pumped during the year. The Poplar Point station handled 832,000,000 gallons of sewage and the Woodridge station 17,000,000 gallons of sewage during the year. The Rock Creek pumping station was completed, including the mechanical installation, and began the delivery to the disposal system of the sanitary drainage of the Upper Potomac on June 15, 1921.

WATER MAINS.

During the year 45,179 feet, or 8.5 miles, of water mains were laid, making a total length of mains now in service 647.5 miles. There were also in service at the end of the year 11,153 valves of various sizes, 3,730 fire hydrants, 238 public hydrants, 17 sanitary fountains, 154 horse fountains, and 44 public wells.

The aggregate cost of the water mains in service June 30, 1921 paid from water department funds, was \$4,329,366.10.

WATER CONSUMPTION.

The mean daily consumption for the year was 61,506,830 gallons, being almost 1,400,000 gallons less than the mean daily consumption for 1920, making a per capita consumption of 140.5 gallons.

The total pumpage for the year was 11,359,892,730 gallons.

Underground leakage discovered and stopped during the year amounted to 990,430 gallons daily.

The total amount of coal burned was 7,466 tons.

The cost of operating pumps for the year was \$118,195.29, making a total operative cost of pumping 1,000,000 gallons of water into the mains of \$10.40.

WATER REVENUES AND EXPENDITURES.

The revenues from all sources, including a balance of \$164,652.22, amounted to \$1,317,424.62. Expenditures of the distribution system amounted to \$902,632.29, advances on account of the Washington Aqueduct to \$185,395.08, leaving a balance of \$229,397.25. This balance is obligated to the amount of \$41,503.43, which leaves an unobligated balance of \$187,839.82.

Of the total cost of work done during the year, 34.4 per cent was for new work, and 65.6 per cent for maintenance.

WATER METERS.

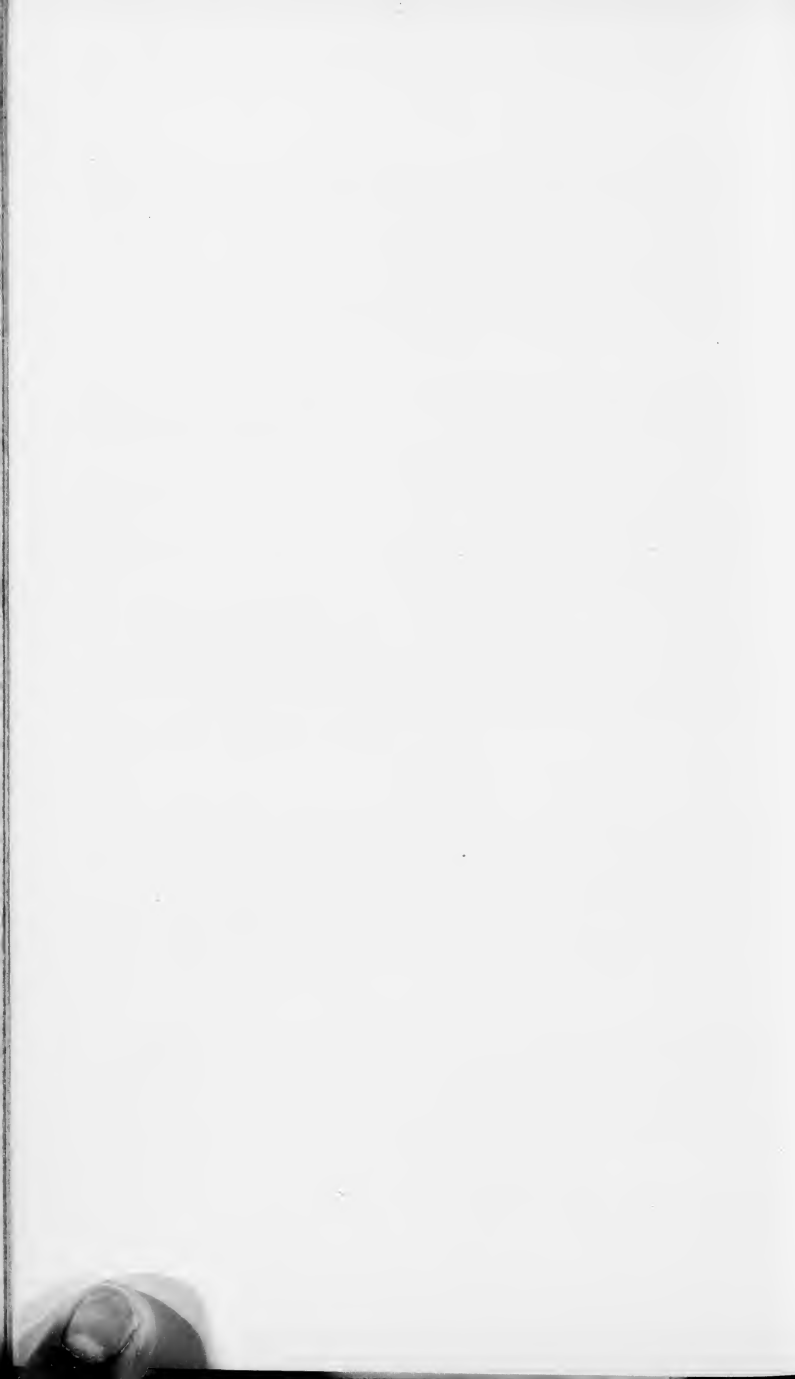
During the year 974 water meters were installed. The continued increased cost of labor and material precluded the possibility of extensive work of this kind during the year. The average cost of installing meters for the year was \$22.55.

The amount of revenue collected during the year under the meter system was \$870,924.79; under the flat rate, \$109,840.95; and for building purposes, \$3,289.49.

The total number of services at the end of the year was 72,898, of which number 62,279, or 85 per cent, are metered.

Very respectfully,

CUNO H. RUDOLPH,
JAMES F. OYSTER,
CHARLES KELLER,
Commissioners of the District of Columbia.



REPORT OF THE OPERATIONS OF THE ENGINEER DEPARTMENT OF THE DISTRICT OF COLUMBIA.

REPORT OF ASSISTANT ENGINEER COMMISSIONER BESSON.

WASHINGTON, October 1, 1921.

SIR: I have the honor to transmit herewith annual reports of the operations of the various divisions and offices under my immediate supervision for the fiscal year ended June 30, 1921.

Very respectfully,

F. S. BESSON,

*Major, Corps of Engineers, United States Army,
Assistant to the Engineer Commissioner.*

The ENGINEER COMMISSIONER.

REPORT OF ENGINEER OF HIGHWAYS.

WASHINGTON, D. C., August 20, 1921.

SIR: I have the honor to submit the following report of the operations of the engineer of highways for the fiscal year ended June 30, 1921. The total amount of funds appropriated by Congress and deposited by corporations and others for disbursement by the highway division aggregated \$2,193,674.84, of which \$285,000 was for paving sidewalks and alleys in all parts of the District; \$569,200 for paving new roadways, \$575,000 for repairing old roadway pavements, including asphalt resurfacing; \$250,000 for repair of suburban roads; \$32,500 for construction and repair of bridges and viaducts; \$30,000 for grading streets and avenues; \$20,000 for sidewalks and curbs around Government reservations, buildings, and parks; \$45,000 for reconstructing the Canal Road wall; while \$386,974.84 was spent in repairing pavements disturbed by other branches of the District government and by various corporations and others.

Summary of work under appropriation for improvement and repairs for year ending June 30, 1921

Character of work.	Street improvements.	Repairs to asphalt pavements.	Total.
Sheet-asphalt pavements.....square yards..	97,435.50	22,801.38	120,236.88
Asphalt-surface pavements.....do.....	.....	28,647.41	28,647.41
Vitrified block gutter.....do.....	6,157.93	1,229.72	7,387.65
Cement concrete pavements.....do.....	41,352.20	.....	41,352.20
Macadam roadway.....do.....	3,600.00	.....	3,600.00
Old pavement removed.....cubic yards..	.....	1,268.18	1,268.18
Old cobble and granite removed.....square yards..	46,649.00	.....	46,649.00
Grime and bluestone set.....linear feet..	36,143.59	1,794.90	37,938.49
Cement curb formed and laid.....do.....	11,999.63	.....	11,999.63
Curb reset.....do.....	22,683.11	10,238.04	32,921.15
Grading.....cubic yards..	51,285.40	1,478.50	52,763.90
Cement sidewalks laid under assessment and permit work.....square yards..	.....	.....	41,500.57
Cement sidewalks laid around Government reservations.....do.....	.....	.....	7,892.67
Alley pavements, assessment and permit work:			
Cement.....do.....	.....	.....	23,502.71
Vitrified block.....do.....	.....	.....	60.00

The following is a list of tables appended to the report:

Table A.—Street railways in the District of Columbia, July 1, 1921.

Tables B and C.—Statement of character and extent of street pavements.

Table E.—Street improvements.

Table F.—Repairs to asphalt and coal tar pavements.

Table G.—Work done for street railways companies.

Table H.—Work done by day labor under appropriation for "Repairs to streets, avenues, and alleys."

Table I.—Regular permit work.

Table K.—Assessment work.

Table L.—Replacing and repairing sidewalks and curbs around public reservations.

Table M.—Miscellaneous work.

Table N.—Whole cost work.

Table O.—Repairs to cuts by plumbers and others.

Table P.—Grading streets, alleys, and roads.

Of the above tables, B, C, and O are printed herewith. The remaining tables are on file in the record room of the office of the engineer of highways, plan case No. B-1048.

The cost of work showed but slight recessions. Toward the end of the year the tendency was rather markedly downward, but the greater portion of the work had been, of necessity, committed to contract obligations at prices little better than the recent past. Labor morale was continuously improved and difficulty in securing construction material practically disappeared. Notable items of street improvement were the paving of Nichols Avenue from Sheridan Road to the southern entrance to St. Elizabeths Hospital; New Hampshire Avenue from I Street to Twenty-seventh Street; Louisiana Avenue from Tenth Street to Pennsylvania Avenue; and the east roadway of Connecticut Avenue from Chapel Road to the District Line. The resurfacing with bituminous macadam of Bladensburg Road from near M Street to the District Line at a cost of \$55,886.27, and of Alabama Avenue, Pennsylvania Avenue to Ridge Road; and Bowen Road, Ridge Road to the District Line at a cost of \$21,676.20 was done by day labor after efforts to secure bids for the work within the funds appropriated had failed.

For the first time the procedure was followed of surfacing with sheet asphalt concrete roadways laid in past years whose surface conditions, due to use, justified the treatment. All our concrete roadways are constructed in anticipation of such treatment and on grades that allow for it. Four such streets were surfaced and the results were entirely satisfactory.

Our heavily traveled suburban thoroughfares should be paved with sheet asphalt on a concrete base as rapidly as funds can be secured in the interest of economy and the public convenience and comfort. Except for a small fraction of our contract alleys and sidewalks and the rebuilding of the canal wall, also in progress under contract, the year's work is completed.

Alleys were paved with cement concrete to the extent of 23,503 square yards.

MUNICIPAL ASPHALT PLANT.

The total output of the municipal asphalt plant for the year was 215,832 cubic feet of material, consisting of 195,336 cubic feet of old material mixture, 3,624 cubic feet asphaltic concrete mixture, and 16,872 cubic feet of topping mixture. The plant was operated for 248 days, with an average daily output of 870 cubic feet. In con-

nection with the output of the plant the crusher was operated for 76 days during the year and 4,302 cubic yards of old material hauled to the plant from various streets was crushed.

Constant attention is given to the maintenance of both the plant and the crusher, repairs being made and parts replaced when necessary, thereby keeping them in the best operating condition possible. This cost is incorporated in the total cost of output shown below.

The following materials in amounts set forth below were purchased for use in manufacturing the output during the year:

Limestone dust, 190 tons, cost average.....	\$4.40
Sand, 3,382.50 cubic yards, cost average.....	2.01
Screenings, 25 tons, cost average.....	2.60
Asphaltic cement, 621.58 tons, cost average.....	24.61

There were purchased for use in operating the crusher and mixer the following large items:

Fuel oil, 28,612 gallons, cost average.....	\$0.101
Coal, 196 tons, cost average.....	9.25
Wood, 76 cords, cost average.....	19.80

The cost of operation, including labor and material, are kept from day to day and the summary of this data for the fiscal year develops the following unit costs for the year's operation:

Operation of crusher.

[Period of operation, 76 working days; output of crusher, 4,302 cubic yards]

Labor and fuel.....	\$6,549.29
Cost per cubic yard, \$1.52.	
Maintenance, renewals, and repairs.....	556.55
Cost per cubic yard, \$0.129.	
Overhead cost: The original cost was amortized by deducting 20 per cent from same each year during the first five years of its life.	
Cost of crushed product per cubic yard:	
Labor and material.....	1.52
Repairs to plant.....	.129
Total cost.....	1.649

Operation of plant.

[Period of operation, 248 days; total output, 215,832 cubic feet.]

At plant:	
Labor (6.80 cents per cubic foot).....	\$14,678.14
Fuel oil (1.38 cents per cubic foot).....	2,985.99
Coal (0.76 cent per cubic foot).....	1,651.36
Wood (0.40 cent per cubic foot).....	863.32
Total (9.34 cents per cubic foot).....	20,178.81
Haul from plant to street:	
Labor (8.46 cents per cubic foot).....	17,686.28
On street:	
Labor (25 cents per cubic foot).....	52,279.19
Painting joints (0.45 cent per cubic foot).....	955.85
Wood (0.30 cent per cubic foot).....	647.49
Total (25.75 cents per cubic foot).....	53,882.53
Maintenance and repairs:	
At plant (0.89 cent per cubic foot).....	1,939.69
On street (0.11 cent per cubic foot).....	231.20
Total (1 cent per cubic foot).....	2,170.89

Overhead: The original cost was amortized by deducting 20 per cent from same each year during the first five years of its life.

Supervision:

Foremen and overseers (3.55 cents per cubic foot)..... \$7,658.92

Total manufacturing cost per cubic foot:

	Cents.
Plant labor.....	9.34
Hot haul.....	8.46
Street work.....	25.75
Maintenance of plant and tools.....	1.00
Supervision.....	3.55

Total..... 48.10

The sand used was bought under contract at 80 cents per cubic yard and hauled from the wharf to the plant at the cost of \$4,085.94 for 3,382.50 cubic yards, or \$1.21 per cubic yard, a total of \$2.01 per cubic yard. All other expendable material was delivered at the plant site at the cost thereof used herein.

The cost of a cubic foot of old material mixture from the above was as follows:

0.65 cubic foot of old material, at \$1.65 per cubic yard.....	\$0.0397
0.35 cubic foot sand, at \$0.80 per cubic yard, hauled \$1.21 per cubic yard..	.0260
3.12 pounds limestone dust, at \$4.40 per ton.....	.0069
4.58 pounds asphaltic cement, at \$24.61 per ton.....	.0563

Cost of material..... .1289

Manufacturing and placing cost..... .4810

Total cost per cubic foot..... .6099

Asphaltic concrete mixture:

0.50 cubic foot screenings, at \$2.60 per ton (2,000 pounds).....	.0662
0.50 cubic foot sand, at \$0.80 per cubic yard, hauled \$1.21 per cubic yard..	.0371
4.20 pounds limestone dust, at \$4.40 per ton.....	.0092
9.16 pounds asphaltic cement, at \$24.61 per ton.....	.1127

Cost of material..... .2252

Manufacturing and placing cost..... .4810

Total cost per cubic foot..... .7062

Topping mixture:

1 cubic foot of sand, at \$0.80 per cubic yard, hauled \$1.21 per cubic yard..	.0742
4.20 pounds limestone dust, at \$4.40 per ton.....	.0092
9.16 pounds asphaltic cement, at \$24.61 per ton.....	.1127

Cost of material..... .1961

Manufacturing and placing cost..... .4810

Total cost per cubic foot..... .6771

The total cost of minor repairs to sheet asphalt pavements during the year, the same representing the maintenance cost during the year, was \$122,141.83. This cost represented the maintenance of all asphalt streets not under guaranty by contractors, a total yardage of 3,253,588. The cost per square yard per year was therefore about 3.75 cents.

For purposes of record and comparison the like annual costs are here stated for past years: 1908, 3.8 cents; 1909, 2.3 cents; 1910, 2.6 cents; 1911, 2.2 cents; 1912, 2.4 cents; 1913, 2 cents; 1914, 1.9 cents; 1915, 1.9 cents; 1916, 1.8 cents; 1917, 1.5 cents; 1918, 1.7 cents; 1919, 3.07 cents; 1920, 3.38 cents.

The municipal asphalt plant began operations in 1912, repairs being made by contract during the first quarter of that year, and with the municipal asphalt plant during the last three quarters of that year and continuously since. The marked reduction for the year 1917 is affected very significantly by the law effective that year by which repairs to pavements over one year old are chargeable to repair appropriations instead of being paid for by the paving contractors under a five-year guaranty, as formerly. The yardage of pavement over which our repairs were distributed was thus increased by nearly 700,000 square yards, on which practically no expenditures were needed, as the pavements were only from one to five years old.

In connection with these costs of annual repair it should be considered that some of the streets approximate an age of 40 years and that the average age of those we have resurfaced in recent past years exceeds 25 years. The average age of streets resurfaced in 1910 was 25.8 years; in 1911, was 24.5 years; in 1912, was 25.8 years; in 1913, was 26 years; in 1914, was 28.5 years; in 1915, 28 years; in 1916, was 29.6 years; in 1917, was 27 years; in 1918, was 26 years; in 1919, was 26.7 years; in 1920, was 23.6 years; in 1921 was 23 2 years.

During the year there was purchased from the Cranford Paving Co., under contracts Nos. 6798 and 6985, the following material in bulk at contractor's plant, to be used in connection with minor repairs to asphalt pavements and repairs to cuts:

6,792 cubic feet of topping, at 48 cents per cubic foot.....	\$3, 260. 16
6,118.40 cubic feet binder, at 38 cents per cubic foot.....	2, 336. 39
15,216 cubic feet topping, at 56 cents per cubic foot.....	8, 520. 96
14,956.80 cubic feet binder, at 42 cents per cubic foot.....	6, 281. 86
Total.....	20, 399. 37

This material hauled from plant and laid in the streets by the District of Columbia minor-repair forces.

The reason for the above procedure was the abnormal need for repair work on our streets due to war activities and an effort to prevent their deterioration under such excessive use by heavy trucks and other increment of traffic. The plant alone could hardly have fully met such a demand and was not subjected to the injurious strain of attempting it. The prices paid for the material purchased were about equal to our own cost of production with a 15 per cent addition thereto.

STREETS.

Table H is a summary of work done by day labor under the appropriation for current repairs to streets, avenues, and alleys. The cost of such work was \$133,659.98.

Table I is a list of work done under the permit system, wherein the property owners requested the improvement and paid one half cost, the District paying the other half. The cost was \$41,037.49.

Table K is a list of work done under the assessment system. One-half of the cost of such work is charged against the abutting property. The total cost was \$257,681.81.

Table L is a list of the work paid from the appropriation for replacing sidewalks and curbs around public reservations. The amount expended was \$21,178.58.

These tables are on file in this office.

Repairs to streets, avenues, and alleys, appropriation 1921, under supervision of engineer of highways.

Brick sidewalk relaid.....	square yards..	10, 346
Asphalt block paved.....	do.....	687
Asphalt block repaved.....	do.....	12, 851
Vitrified block paved.....	do.....	1, 017
Vitrified block repaved.....	do.....	4, 625
Macadam roadway.....	do.....	485
Curb reset.....	linear feet..	1, 407
Flag relaid.....	square yards..	164
Granite block laid.....	do.....	6, 342
Cement walk relaid.....	do.....	3, 978
Cobble relaid.....	do.....	2, 014
Grading.....	cubic yards..	4, 862
Labor.....		\$121, 675. 99
Material.....		\$11, 983. 99

SUMMARY.

Northwest section, east of Sixteenth Street.....	\$31, 844. 32
Northwest section, west of Sixteenth Street.....	25, 208. 87
Northeast section.....	19, 259. 24
Southeast section.....	27, 291. 41
Southwest section.....	19, 253. 74
Georgetown.....	10, 802. 40
Total.....	133, 659. 98

SUBURBAN ROADS.

The work of this division for the year ended June 30, 1921, consisted principally of repairs and upkeep of approximately 150 miles of macadamized roads and streets, and 50 miles of gravel roads. Due to the conditions obtaining at the close of the war many of the roads were in bad condition, but by the autumn of 1920, normal conditions as to surface were about restored; and since that time there has been further improvement. Progress in betterment of conditions still remains slow, on account of the continuing high prices of labor and materials, combined with a steady increase of vehicular traffic. The increase in wear of road surfaces due to increased building construction and to heavier loads is noticeable.

The appropriation for repairs to suburban roads was \$250,000; which was entirely expended, and in addition to this amount the appropriation for repairs to streets was drawn upon for repairs to many of the suburban streets. A tabulated statement of the items of work is submitted for filing.

In the matter of new construction on suburban streets, considerable progress was made in extending the paving of some of the trunk highways further outward from the city. The suburban highways on which asphalt roadways were paved, were Georgia Avenue, 60 feet wide, about 1 mile; Connecticut Avenue, 27 feet wide (one roadway only), 1 mile; and Nichols Avenue, 45 and 50 feet wide, about half mile. It is of great importance that these and other main highways should be permanently and completely paved at a date as early as possible.

The roadways of Bowen Road and Bladensburg Road, for which special appropriations of \$21,000 and \$51,000, respectively, were available, were surfaced with bituminous macadam by hired labor, no bids having been obtained which were within the appropriations.

A notable item of the year's work was the grading of Connecticut Avenue, between Pierce Mill Road and Chappell Road, the grade having been widened on both sides sufficiently to permit the construction of footwalks and setting trees.

All of the concrete roadways which were authorized by appropriations were laid under contract at prices somewhat lower than those of last year.

The grading and graveling of Thirty-eighth Street SE. was delayed by condemnation proceedings, and was placed under contract. It will be completed by the winter of 1921. All other work authorized was completed.

The recommendations made in the previous reports of this office relative to the early paving of trunk highways, the use of bituminous macadam on roadways of secondary importance, and as to restrictive legislation limiting the weights of loaded vehicles, are respectively renewed.

BRIDGES.

The expenditures from the appropriation for the construction and repair of bridges were as follows:

Construction and repair of bridges.

Repairs.....	\$27,923.74
Construction of bridges.....	4,113.51
Materials, tools, salaries, etc.....	16,053.84
Total.....	48,091.09
Less materials on hand purchased from appropriation from previous years..	18,395.68
Net expenditures.....	29,695.41
Repayment.....	2,326.21
Highway Bridge across Potomac River (turned over to commissioners, District of Columbia, May 1, 1921): Labor, maintenance, and painting..	7,314.52
Bridge No. 1 (Chain Bridge): Reflooring in progress; incomplete, due to lumber shortage.	
Bridge No. 7 (Aqueduct Bridge): Refloored under authorization of the United States Engineer Office.	
Bridge No. 20 (Pierce Mill Road over Rock Creek): Construction of new abutment completed; reflooring and emplacing iron handrail completed; roadway surfaced with asphalt under contract with Cranford Paving Co. at a cost of.....	619.78
Bridge No. 35 (M Street over Rock Creek): Reflooring completed; roadway surfaced with asphalt by District asphalt plant.	
Bridge No. 54 (Pennsylvania Avenue over Anacostia River): Reflooring completed.	
Bridge No. 55 (Eleventh Street SE. over Anacostia River): Repairs to fender completed at a cost of.....	269.32
One-half of roadway resurfaced with asphalt at cost of.....	2,051.03
Sand and gravel wharf: Repairs to bin completed at a cost of.....	808.43
Bridge No. 198 (Fiftieth Street NE. over Watts Branch): Contract No. 7096 entered into with Charles H. Tompkins for construction of a reinforced concrete bridge; work completed Dec. 21, 1920, at a cost of.....	3,959.40
Wharf No. 6 (old ferry wharf on Water Street between M and W Streets SW.):	
Contract entered into with A. R. Thompson for removal of old buildings completed Sept. 20, 1920. The District received \$611 for the material removed. Bids were requested for reconstruction of portion of revetment wall; all bids were rejected as excessive and the work was performed by day labor at a cost of.....	12,259.55
Contract No. 7162 entered into with the Dorsey-Miller Co. for removal of old piles, cribbing, etc., and driving new piles, including capping and framing of same; work now in progress.	

Canal wall reconstruction:

Contract No. 6815 with Hyde & Baxter for reconstruction of portion of gravity and reinforced sections completed Apr. 26, 1921, at a cost of. \$24,451.31

Repairs to canal wall at Fletcher's boathouse were completed by day labor at a cost of. 1,567.54

Contract No. 7163 entered into with the Warren F. Brenizer Co. for reconstruction of portion of gravity wall; work now in progress.

Foot bridge in line of Fourth Street SE. over Oxen Run completed by day labor at a cost of. 171.80

My acknowledgments are due to the employees of this division for the work accomplished by the office during the year.

Very respectfully,

C. B. HUNT,
Engineer of Highways.

ASSISTANT TO THE ENGINEER COMMISSIONER.

TABLES B AND C.—Character and extent of roadway pavements July 1, 1921.

SQUARE YARDS.

Section.	Asphalt.	Asphalt block.	Asphaltic concrete, concrete base.	Asphaltic concrete, stone base.	Cement concrete.	Durax block (small granite block).	Granite and rubble.
Northwest city.....	1,816,981	25,323	9,674	6,372	20,999	12,294	96,627
Northeast city.....	397,647	196,867	3,127		11,825		18,289
Southeast city.....	234,736	249,000	8,019	4,082	1,324		37,605
Southwest city.....	285,938	40,436	13,535		11,148		149,638
Georgetown.....	156,171	23,076	4,144	905		5,674	30,492
Northwest suburban.....	382,575	84,046	25,855	36,680	163,049		23,945
Northeast suburban.....	82,372	6,925	14,354		28,940		
Southeast suburban.....	21,203			3,049	12,933		1,000
Total.....	3,377,623	625,673	78,708	51,088	250,218	17,968	357,596

Section.	Vitrified block.	Cobble.	Macadam (estimated).	Gutters on asphalt streets.	Gutters on asphaltic concrete streets.	Pavements maintained by street railroads.	Total.
Northwest city.....	9,855	6,445	22,517	119,469	1,128	287,110	2,434,794
Northeast city.....	3,882		36,659	31,584	231	69,316	769,427
Southeast city.....		13,122	46,700	16,640	898	48,328	660,454
Southwest city.....	3,138	7,070	10,300	24,515	1,254	56,820	603,792
Georgetown.....	515	10,419	3,000	5,979	498	31,816	272,689
Northwest suburban.....			1,304,240	28,159	5,871	54,765	2,109,185
Northeast suburban.....			385,481	5,764	1,019	9,000	533,885
Southeast suburban.....			73,662	6,385	272	7,370	125,874
Total.....	17,390	37,056	1,882,559	238,495	11,201	564,525	7,510,100

MILEAGE.

Section.	Asphalt.	Asphalt block.	Asphaltic concrete, concrete base.	Asphaltic concrete, stone base.	Cement concrete.	Durax block (small granite block).
Northwest city.....	93.38	1.57	0.51	0.24	1.15	0.30
Northeast city.....	20.81	8.74	.19		.80	
Southeast city.....	12.61	12.40	.43	.17	.09	
Southwest city.....	15.48	2.37	.68		.36	
Georgetown.....	9.30	1.51	.49	.06		.27
Northwest suburban.....	21.39	4.52	1.31	2.00	8.89	
Northeast suburban.....	5.15	.63	.97		1.65	
Southeast suburban.....	1.83			.21	.51	
Total.....	179.98	31.74	4.58	2.68	13.45	.57

TABLES B AND C.—*Character and extent of roadway pavements July 1, 1921—Contd.*

MILEAGE—Continued.

Section.	Granite and rubble.	Vitrified block.	Cobble.	Macadam (estimated).	Gravel and unimproved (estimated).	Total.
Northwest city.....	5.45	0.50	0.12	1.00	2.54	106.76
Northeast city.....	.91	.24	.....	1.98	4.29	37.99
Southeast city.....	2.19	.....	.66	2.21	7.07	37.83
Southwest city.....	7.75	.27	.30	.52	2.62	30.35
Georgetown.....	2.12	.03	.48	.06	.76	15.08
Northwest suburban.....	1.13	.....	.....	81.77	52.23	173.24
Northeast suburban.....	.....	.....	.....	27.63	43.00	79.03
Southeast suburban.....	.04	.....	.....	5.68	36.37	44.64
Total.....	19.59	1.04	1.56	120.85	148.88	524.92

TABLE O.—*Number of square yards and cost of repairs to cuts in various streets, sidewalks, and alleys during the fiscal year ending June 30, 1921, chargeable to various plumbers, corporations, individual depositors, and appropriations of the District and Federal Governments.*

	Flat rate.	Whole cost.	Total.
Plumbers.....	\$16,988.61		\$16,988.61
Corporations.....	76,385.08	\$185,338.62	261,723.70
Individual depositors.....	9,825.85		9,825.85
Various appropriations of the District and Federal Governments.....	36,806.63	61,630.05	98,436.68
Total.....	140,006.17	246,968.67	386,974.84

SQUARE YARDS REPAIRED.

	Flat rate.	Whole cost.
Sheet.....	4,278.25	6,361.57
Vitrified block.....	1,426.20	3,814.51
Asphalt block.....	2,229.88	7,834.50
Granite block.....	930.48	9,722.64
Cobble.....	370.46	1,101.57
Cement.....	13,223.32	.....
Brick.....	121,942.00	4,086.26
Macadam.....	1,595.49	2,684.00
Durax block.....	40.00	11,169.53
Scoria block.....	43.39	2,037.40
Wood block.....	2.00	188.11
Concrete roadways.....	1,189.06	287.29

1 Feet.

REPORT OF THE INSPECTOR OF ASPHALTS AND CEMENTS.

WASHINGTON, August 18, 1921.

SIR: I have the honor to submit the following report showing the operations of this division during the fiscal year ending June 30, 1921.

The work of this division represented by the number of tests made show an increase of approximately 65 per cent as compared with the previous year, the principal increase being in testing hydraulic cements—11,246 samples against 5,961 submitted during the previous year.

There was also an increase in the number of miscellaneous samples, principally old asphalt surface materials, sands, asphalts and various mixtures prepared in connection with special experiments conducted under your personal supervision.

ASPHALT PAVEMENTS.

During the year there were laid by the Cranford Paving Co., contractors for the laying of new and resurfacing asphalt pavements, approximately 51,448 square yards in which Aztec and Standard asphalts were used.

The municipal asphalt plant produced about 198,960 cubic feet of asphalt-concrete and topping mixtures, used in the patching and repairs to asphalt pavements in which Standard asphalt was used.

The Corson & Gruman Co., contractors for laying new asphalt pavements, laid about 23,692 square yards in which Standard asphalt was used.

PORTLAND CEMENTS.

The testing of 11,246 samples, representing 112,517 barrels, of which 1,337 were rejected.

Results of tests and by whom submitted are shown in Tables Nos. 7 and 8 attached.

While the work during the year has increased, it has been kept current and is current to date.

Statements showing number of samples tested and examination of asphalts, asphalt cement, and other materials are on file in this office.

J. O. HARGROVE,

Inspector of Asphalts and Cements.

ASSISTANT TO ENGINEER COMMISSIONER.

REPORT OF THE SUPERINTENDENT OF TREES AND PARKINGS.

WASHINGTON, D. C., *August 10, 1921.*

SIR: I have the honor to submit my fifth annual report dealing with the operations of the trees and parkings office for the fiscal year ended June 30, 1921.

TREES PLANTED.

Two thousand four hundred and fifty-five young trees were planted in their permanent position on the streets during the fiscal year, 141 less than the number planted the previous year. About one-half of the trees planted were for the purpose of filling vacancies in existing rows in the northeast and southeast sections of the city, and the remainder were used in extending the lines into the suburbs and hitherto unplanted localities. Of the number planted 2,430 were set at the curb line, 14 in the parking between the inner edge of the sidewalk and the building line, 8 in the central parking of Louisiana Avenue NW., between Ninth and Tenth Streets, 1 at the public comfort station, Fifteenth Street and Maryland Avenue NE., and 2 in the Langdon School yard. The work of preparing the tree spaces during the fiscal year was performed during the summer and fall months, and the planting of the trees in these spaces was undertaken last spring. It has been the custom of this department to plant trees at two different periods each year, namely, fall and spring. This is the time when trees are in what is known as their dormant state or period of rest. The planting of trees in the fall is advisable provided

the winter is mild. If the winter is severe the upheaval of the ground due to freezing and thawing is very injurious if not fatal to young trees. The planting of trees continues to be a costly item in view of the existing high price of labor and materials of all kinds, and the necessity for longer hauls due to the rapid growth of the city. The cost of planting 2,027 was paid for from the appropriation for the parking commission, 21 from appropriations for other departments, and 407 from whole cost deposits.

TREES REMOVED.

At the beginning of the fiscal year there were a great many dead trees standing on public space throughout the city, and an extra effort was made to remove the same. Around the 1st of April nearly all dead trees had been removed from public space. During the year all the Carolina poplar and silver-maple trees were removed from both sides of Shepherd Street NW., between Rock Creek Church Road and Georgia Avenue, and the same were replaced with 82 pin oaks. A total of 2,232 trees were removed during the fiscal year for various reasons.

Of the 2,232 trees removed during the year, 205 were decayed and dangerous; 122 were of inferior and condemned varieties; 9 to relieve excessive shade; 110 because of street improvements; 14 for drive-ways; 1 for vault; 16, improvements to alleys; 46 by accidents; 137, storms; 19, close proximity to buildings; 2, entrances to buildings; 16, interference with building operations; 27, interference with curb trees; and 10, parking improvements. It was ascertained that 32 trees were destroyed by illuminating gas, 38 by salt water, 128 by abnormal moisture supply, 51 by being filled around, 32 by being girdled, 6 by drought, 19 by insects, scale, borers, sycamore louse, etc., 54 by root mutilation, 2 by oil, 2 by sewer gas, 2 by being over-shadowed, 34 by horse bite, and the deaths of 1,098 were unexplained.

Of the number removed 2,026 stood at the curb line, 7 in school grounds, 154 in the parkings, 25 in the sidewalk, 4 in the roadways, 14 in alleys, 1 on the grounds of the District of Columbia property yard, and 1 on the grounds of the crematorium.

The cost of removing 2,031 trees was paid for from the appropriation for the parking commission, 173 from the appropriations for other departments, and 28 from whole-cost deposits.

TREES SPRAYED.

It was necessary to perform the usual amount of spraying for leaf-eating insects during the year, and as a result 50,612 trees were sprayed for the extermination of the elm-leaf beetle, tussock moth, and the fall web worm. These trees were sprayed with arsenate of lead. In addition to spraying work performed for the destruction of leaf-eating insects, this office sprayed 2,910 trees with nicotine-sulphate near the end of May for the destruction of the aphid or plant lice. This insect made its appearance in unusually large numbers the past spring, and at one time the situation became a very serious problem. During the winter 5,529 trees were treated with lime-sulphur solution for the destruction of scale insects.

NURSERIES.

The nursery at Fort Dupont is well stocked with fine trees. This ground is well adapted for tree nursery purposes, although there is not enough ground in this tract to grow a sufficient number of trees to keep up with the rapid growth of the city. During the fiscal year 108 pin-oak, 874 red-oak, 574 elm, 528 Norway-maple, and 156 silver-maple seedlings were planted in the nursery rows, and they can be transferred to their permanent position on the streets in the next five to seven years.

TRIMMING.

It was impossible to undertake any systematic trimming of trees during the fiscal year 1920, owing to the scarcity of labor. This work, however, was resumed during the fiscal year 1921, and as a result the dead wood and low limbs were removed from all trees on public space north of the Mall to Florida Avenue and west from Fourth to Eighteenth Streets NW.; also the low limbs were removed from the trees on all streets north of Florida Avenue and west of North Capitol Street to Rock Creek; all streets in Cleveland Park, Chevy Chase, section east of North Capitol Street and north of Florida Avenue NE., and all streets in Twining City, Anacostia, and Congress Heights. These trees did not require any great amount of trimming except to remove low limbs to prevent their interference with pedestrian and vehicular traffic. In the down town section of the city the trees are older and many of these are in need of severe trimming, topping off, etc. This treatment is about the only remedy for the old silver maples as they are fast deteriorating, and will have to be removed from the streets in a few years as a matter of safety to the public. It is hoped that this work can be undertaken in the near future. A total of 30,801 trees were trimmed during the year.

CULTIVATING YOUNG TREES, MOWING PARKINGS, AND REMOVING TREE BOXES.

At the beginning of the fiscal year nearly all small trees had received their usual spring cultivation, and this work was continued until they had been given attention. This work was resumed again the past spring, and at the close of the year a great many of the young trees had not been cultivated. This work will be continued until the entire tree-planted system has been given this yearly needed attention. A total of 4,396 trees were cultivated during the year.

The work of mowing the weeds on parkings abutting unimproved property was in progress at the beginning of the fiscal year. This work was performed at the same time the young trees were cultivated.

A total of 4,239 wooden tree boxes were removed during the year from trees which no longer required their protection.

PAVING OF ABANDONED TREE SPACES.

The work of paving abandoned tree spaces throughout the city during the year was performed by the surface division, engineer department, and the cost of the work paid from the appropriation for the parking commission. A total of \$608.49 was spent on this work.

REGULATION OF TERRACES.

In addition to the inspections in cases pertaining to trees, this office examined and issued 635 permits affecting the grade of terraces in connection with building operations during the year.

Summary.

Curb trees on streets at close of fiscal year 1920.....	105,399
Net increase of curb trees during fiscal year 1921.....	404
Curb trees on streets at close of fiscal year 1921.....	<u>105,803</u>

Very respectfully,

C. LANHAM,
Superintendent of Trees and Parkings.

To the ASSISTANT ENGINEER COMMISSIONER.

REPORT OF THE CITY REFUSE DIVISION.

WASHINGTON, D. C., August 6, 1921.

SIR: I have the honor to submit the following report of the city refuse division, engineer department, for the fiscal year ended June 30, 1921.

Two appropriations covered the operations of this division, one of \$375,000 for dust prevention, cleaning of streets and alleys, and snow removal, the second of \$750,000 for the collection and disposal of garbage, ashes, and miscellaneous refuse.

STREET AND ALLEY CLEANING.

The yardage cleaned, the methods employed in this work, and the cost of each is shown in the tables accompanying this report.

The reduced cost per yard of this work is to be noted and is gratifying as indicating a growing labor efficiency, particularly noticeable in the latter months of the year.

On account of the mild winter no snow and ice work was necessary, but, as in the previous year, the refuse from Center, Western, and Eastern Markets was collected and disposed of as a street cleaning function at a cost of \$1,006.94.

GARBAGE COLLECTION AND DISPOSAL.

Sixty thousand and fifty-eight tons of garbage were collected during the year, an amount greater than ever collected before, notwithstanding private individuals were permitted throughout the year to collect and transport this material to points outside of the District of Columbia to be fed to poultry and pigs. The cost of this collection was \$244,440.56.

The revenue from grease and tankage produced from this garbage at the reduction plant was \$155,196.61.

This sum is small as compared with the two previous years because of the unprecedentedly low prices prevailing for such products, par-

ticularly during the latter portion of the year. Since April the price offered for tankage has not equaled the cost of production, and in consequence the press cake has been piled and not sold.

The net cost of operation of the disposal plant was \$194,162.74, so that the loss on the reduction service for the year was \$38,966.07.

Notwithstanding this unfavorable showing, I am convinced that the safest and most economical disposition the District can make of the garbage produced within its limits is by the maintenance and proper upkeep and by the betterment of the reduction plant at Cherry Hill.

ASHES.

Because of the mild winter there was not the usual production of ashes by householders. One hundred and thirty-five thousand nine hundred and forty cubic yards were collected as compared with 148,228 cubic yards the previous year. The cost of this service was \$116,421.04.

MISCELLANEOUS REFUSE.

During the past year the District collected the miscellaneous refuse and operated the salvage plant for the contractor who had failed the year before, but whose contract did not terminate until June 30, 1921. The revenue from salvaged material amounted to slightly more than the cost of operating the disposal plant. The prices received in July and August were abnormally high, but suddenly the bottom dropped out of the market, and since September prices have been abnormally low.

GENERAL.

All of these services are becoming perceptibly more and more costly by reason of the difficulty in securing dumping places for the waste material. In my last annual report I referred to this situation. Since that time there have been many requests from merchants and others for a public dump. Such facility is not obtainable in the District of Columbia. It is believed the time has come when dumping ground must be acquired outside of the District of Columbia. An incinerator of large capacity would be of service in reducing the waste material to a smaller bulk, but in any event property where waste material can be dumped is urgently needed.

Beginning April 1 a reduction of about 7 per cent was made in the wages of laborers throughout the service. The large proportion of the street-cleaning force was being paid \$3.25 per day. They were reduced to \$3.09 per day. Garbage collectors, paid \$3.81 per day, were reduced to \$3.57 per day.

In the last three years the District has taken over as municipal functions the garbage, ash, and trash services. The wisdom of doing this work by day labor rather than by contract has been demonstrated, but further improvement in these services would result if this division was furnished with improved quarters for the stock and equipment used on this work. Appropriations have been sufficient to keep running, but funds have not been allowed for betterments such as new stables, which additions would not only secure better results in the several services, but would make them more economical to

operate. Urgent necessities are: a stable in the suburbs to shorten the haul of horse-drawn vehicles, a stable and wagon sheds to replace the present leased property where the horses used in the ash service are sheltered, a shop where repairs to all the equipment used in the several services would be made, a garage for trucks used in the garbage service, the overhauling and remodeling of the present garbage reduction plant, an up-to-date trash plant with incinerator of large capacity located in the industrial section along the railroad, and the acquisition of property outside the District of Columbia for dumping purposes.

It is hoped, further, that much deserved salary increases to annual employees of this division may be forthcoming. My acknowledgments are due them for the work accomplished by the office during the year.

Very respectfully,

MORRIS HACKER,
Supervisor City Refuse.

ASSISTANT TO THE ENGINEER COMMISSIONER.

Cost of street cleaning July 1, 1920, to June 30, 1921.

	Area.	Cost.	
		Total.	Unit per 1,000 yards.
	<i>Sq. yards.</i>		
Machine cleaning.....	119,256,000	\$48,237.93	\$0.404
Alley cleaning.....	69,090,000	45,696.39	.661
Suburban cleaning.....	60,382,000	33,372.65	.549
Hand patrol.....	1,323,163,000	253,485.93	.192
Motor flushing.....	40,842,000	7,424.31	.182
Squeegeeing.....	127,596,000	27,684.70	.217
Sprinkling.....		6,048.10	
Dumpmen.....		5,963.09	
Property accounting.....		2,422.49	
Waste-paper boxes.....		1,684.67	
Snow and ice.....		2,688.15	
Annual overhead.....		3,115.42	
Total.....		437,823.83	

Yearly cost of cleaning by various methods.

Class of work.	Average 1,000 yards under attention.	Total cost.	Average cost for each 1,000 yards under attention for year.	1,000 yards cleaned.	Average number of cleanings for year.
Hand patrol ¹	4,606	\$253,485.93	\$55.03	1,323,163	287
Machine sweeping.....	862	48,237.93	55.96	119,256	138
Alley cleaning.....	1,151	45,696.39	39.70	69,090	60
Suburban streets.....	1,619	33,372.65	20.61	60,382	37
Squeegeeing.....	3,008	27,684.70	9.20	127,596	42
Motor flushing.....	903	7,424.31	8.22	40,842	45

¹ Hand patrol work is habitually in combination with squeegeeing and flushing.

Table showing comparative data in connection with street-cleaning work, 1917 to 1921.

SQUARE YARDS CLEANED.

	1917	1918	1919	1920	1921
Hand patrol.....	1,024,688,000	879,574,000	748,142,000	1,173,802,000	1,323,163,000
Machine sweeping.....	219,869,000	205,504,000	218,682,000	98,350,000	119,256,000
Alley cleaning.....	65,471,000	49,878,000	57,208,000	55,344,000	69,090,000
Suburban streets.....	58,940,000	38,393,000	32,876,000	34,550,000	60,382,000
Squeegeeing.....	169,566,000	125,520,000	89,868,000	111,008,000	127,596,000
Flushing.....	27,485,000	16,776,000	5,539,000	24,433,000	40,842,000
Motor flushing.....	6,135,000	12,621,000	12,213,000		

DIRECT TOTAL COST.

Hand patrol.....	\$148,401.40	\$165,521.33	\$195,665.33	\$237,490.76	\$253,485.93
Machine sweeping.....	37,583.20	49,242.68	77,555.50	40,915.64	48,237.93
Alley cleaning.....	24,221.64	30,018.51	45,118.53	44,239.33	45,696.39
Suburban streets.....	20,164.21	18,986.48	20,540.42	24,231.40	33,372.65
Squeegeeing.....	20,560.73	21,141.04	20,929.32	24,743.81	37,684.70
Flushing.....	7,829.54	7,566.84	2,757.63	6,835.91	7,424.31
Motor flushing.....	721.60	3,964.29	4,418.61		

COST PER 1,000 SQUARE YARDS.

Hand patrol.....	\$0.145	\$0.189	\$0.261	\$0.202	\$0.192
Machine sweeping.....	.171	.239	.354	.416	.404
Alley cleaning.....	.371	.603	.789	.800	.661
Suburban streets.....			.625	.702	.549
Squeegeeing.....	.121	.168	.233	.223	.217
Flushing.....	.285	.450	.497	.279	.182
Motor flushing.....		.314	.361		

Total cost of street cleaning, including all charges, except interest on investment and depreciation.....	\$437,823.83
Population served.....	410,000
Cost per capita per year.....	\$1.07

¹ Includes bonus.

Table showing comparative data in connection with disposal of all city wastes from 1917 to 1921.

NUMBER OF UNITS COLLECTED.

	1917	1918	1919	1920	1921
Garbage.....tons.....	44,683	48,874	53,258	52,793	60,058
Ashes.....cubic yards.....	151,783	127,363	134,673	148,228	135,940
Miscellaneous refuse.....do.....	149,810	163,291	149,650	170,286	148,908
Night soil.....barrels.....	11,227	11,300	11,111	12,734	12,507
Dead animals.....number.....	21,562	22,891	19,974	19,995	24,704

TOTAL NET COST.

Garbage.....	\$69,756.00	\$69,290.00	\$267,662.54	\$178,311.57	\$283,406.63
Ashes.....	59,052.00	68,922.64	100,300.00	114,248.38	116,421.04
Miscellaneous refuse.....	27,954.25	26,318.75	51,204.00	46,522.26	66,029.59
Night soil.....	14,994.00	14,998.00	17,500.00	17,500.00	17,500.00
Dead animals.....	2,988.00	2,988.00	3,360.00	3,360.00	3,360.00

Miscellaneous data on contracts.

Class of waste.	Contractor.	Period of contract.	Date of expiration.	Price per annum.	Collected from—
Dead animals...	Charles F. Mann...	5 years....	June 30, 1923	\$3,360	Every part of the District.
Night soil.....	Warner Stutler....	.....do.....	.....do.....	17,500	All privies in the District.

REPORT OF THE MUNICIPAL GARAGE.

WASHINGTON, *August 29, 1921.*

SIR: I have the honor to submit the following report on the municipal garage for the fiscal year ended June 30, 1921.

The garage was necessarily kept open at all times, day and night, for urgent and necessary transportation.

There were maintained and kept in running order 43 automobiles for the various departments of the District government. All machines were washed and supplied with oil and gasoline by the night force, which also served as night watchmen.

The labor and mechanical force consisted of eight men, whose duties were repair work of all kinds, driving for departments which have no drivers assigned to them, and carrying the District government mail from the city post office to the District Building.

The total cost for maintenance and repair of these cars, including gasoline, oil, miscellaneous supplies, and labor, amounted to \$20,200.84. Average cost per car was \$469.78. Average cost per mile was \$0.077.

The total cost of repair parts was \$4,052.13, an average of \$94.23 per car, and an average of \$0.0153 per mile. The average mileage per car was 6,139 miles.

The municipal garage was constructed during the year 1917 for the maintenance of approximately 25 cars, sufficient floor space being allowed for necessary repair work and cleaning of these cars. Additional purchases of new cars during the past four years have increased the number of cars for maintenance at the garage to 43, which necessitates the storing of cars overnight in the aisle; this makes it very difficult for the night men to wash and supply gasoline to the cars. Immediate action should be taken for the relief of this crowded condition.

E. P. BROOKE, *In Charge.*

ASSISTANT TO THE ENGINEER COMMISSIONER.

REPORT OF ASSISTANT ENGINEER COMMISSIONER BROWN.

WASHINGTON, *October 1, 1921.*

SIR: I have the honor to transmit herewith annual reports of the operations of the various divisions and offices under my immediate supervision for the fiscal year ended June 30, 1921.

Very respectfully,

CAREY H. BROWN,
Major, Corps of Engineers, United States Army,
Assistant to the Engineer Commissioner.

To the ENGINEER COMMISSIONER.

REPORT OF THE SURVEYOR.

WASHINGTON, *September 2, 1921.*

SIR: The report on the work of this office for the year ended June 30, 1921, is hereby submitted for the information of Congress, which includes also the condemnation of streets, parks, and alleys.

This work is divided into three parts:

- (1) Work for private parties for which a fee is charged.
- (2) Work for the various departments of the District of Columbia and the Federal Government for which no fee is charged.
- (3) The survey, preparation, and report on all condemnation cases for streets, alleys, and parks.

The work done for private parties for which a fee is charged will show a vast increase in the number of orders taken over the preceding year, there being 8,450 this year as compared with 5,795 for the past year. The total receipts for private work was \$25,355.82.

The work for the last quarter of the past fiscal year shows it to be the largest quarter in the history of the office. The receipts during this period alone amounted to \$8,828.90, and the present indications are that this will continue, and will place an amount of work upon the office force greater than can be performed and at the same time render the service to the public that should be rendered.

A considerable increase in the number of lots surveyed and the number of new lots created by new subdivisions is shown by the following figures:

Lots surveyed, 3,043, against 2,756 the previous year.

Lots created by subdivision, 2,814, against 1,703 the previous year.

Under the new zoning regulations the number of plats prepared for building operations has greatly increased, there being 3,427, against 1,937 the previous year. This work must be done immediately in order that the necessary permits can be secured by the owners, so that the work can be started by them without delay.

Considerable activity has taken place in the undeveloped unsubdivided part of the District, which is indicated by a number of very large subdivisions as follows:

Winfield and Baker, trustees, subdivision (addition to Hampton Park) creating 10 new squares;

Gordon and Newlands' subdivision creating 21 new squares;

McCormick and Childress, executors and trustees, Orren G. Staples estate, subdivision creating 13 new squares;

William S. Phillips' subdivision (Villa Flora) creating three new squares;

Charles G. Taylor's subdivision creating eight new squares; and the

Overlook Development Co. et al. subdivisions creating seven new squares.

The subdividing of these large agricultural tracts involves a great amount of work, such as surveying the entire outlines of the tracts and marking all block corners with stone monuments, in addition to the office work of computing and drafting and drawing up final subdivision plats and certificates.

HIGHWAY MAP OF THE DISTRICT OF COLUMBIA.

During the past year a new highway map of the District was prepared, involving a great amount of drafting work. This is very complete, showing the entire District divided into blocks, existing streets, and the proposed streets in accordance with the highway plan. The large park areas are shown colored in green.

This map has been lithographed and 3,000 copies made for distribution to the public for a fee prescribed by the commissioners

WORK DONE FOR THE VARIOUS DEPARTMENTS OF THE DISTRICT OF COLUMBIA AND FOR THE FEDERAL GOVERNMENT.

The work done for the various departments of the District government amounted to about three times as much as that done the previous year, which includes such work as staking off new streets and alleys, locating obstructions, and the location of insanitary places, such as stagnant pools, etc., for the health department.

Much information was furnished in connection with the extension of the Walter Reed Hospital reservation, and the office of Public Buildings and Grounds in connection with the condemnation for the Rock Creek Park connection.

CONDEMNATION OF STREETS, PARKS, AND ALLEYS.

In connection with this work, before the cases are finally disposed of in court, much detail work is necessary by this office, such as (1) a survey and the preparation of plats, descriptions, etc., for the opening, widening or straightening of any streets or alleys by condemnation, as well as the preparation of all dedication plats; (2) also attendance in court is required of an employee of this office during the condemnation proceedings.

There are now pending in court 15 street and park cases, and 4 new cases ordered by the commissioners but not yet filed. During the year 8 have been confirmed. Five alley cases are now in court, with 2 new cases ordered but not yet filed and 11 alley cases confirmed.

In connection with this work damages to the amount of \$49,465.65 for land taken have been allowed by the juries in condemnation cases for streets, alleys, and parks.

A table showing the street, park, and alley cases filed, pending in court and confirmed during the past year, is on file in this office.

PARKS.

The original Federal city is famous for its street plan and for its beautiful parks. Outside of the original city we have a highway plan for the entire District of Columbia, and all property which is subdivided must conform to this plan. The entire District of Columbia is therefore being developed in accordance with a comprehensive and orderly street plan, but there is no provision for parks outside of the Federal city except such as are acquired from time to time by special acts of Congress. This is usually not done, however, in accordance with any plan that has been adopted. It is true that the McMillan park plan was submitted to Congress in 1902, which provides for a park plan outside of the cities of Washington and Georgetown, but there is no provision for executing it, and land is being subdivided and improved with no consideration for this or any other plan. If this condition is permitted to continue over the entire district, many of the beauty spots of the District will be destroyed, and the District will be developed without any provision for parks. Much of this land is sparsely settled, and is comparatively cheap. These should be preserved so that the citizens can walk and ride through them and the children play in the open and breathe the fresh air, to promote the health and happiness of our people. Many magnificent trees and

beauty spots are being destroyed by subdivisions and improvements, thus creating the newer Washington without the liberality of the park spaces as provided in the older city. It is a reflection to say that the original designers of the old Washington showed greater foresight than the designers of the new Washington. These areas should be acquired for the health, recreation and pleasure of our people.

It is gratifying to note that the committee on streets and parks of the board of trade, of which the surveyor is a member, have had introduced in Congress bills providing for Piney Branch Parkway, Klinge Road Valley, and the Patterson tract. The necessity for the acquisition of these parks needs little comment from me. Their locations are ideal, they are covered with magnificent forest trees, and they are well distributed in different parts of the District. They have previously been approved by the commissioners, and should be included again, with the addition, I think, of extending the Fort Drives so as to include the old Civil War forts built for the defense of Washington, two of which have already been acquired, namely Fort Davis and Fort Dupont.

ALLEYS.

The law which provides for the elimination of alley dwellings was suspended for one year after the signing of the peace treaty. Since the close of the fiscal year it has become general knowledge that the peace treaty has been signed, and therefore the alley law will soon become effective. This office has already made recommendations for certain changes which are believed to be desirable. It would seem to be highly important that the commissioners take some action in regard to this law.

Now that things are returning to normal, this alley problem as to alley dwellings should be prosecuted vigorously, as many of these alleys are densely crowded, insanitary and a menace to the health and welfare of the community. They are breeding places for crime where policemen dare not venture without endangering their lives. They harbor "bootleggers" and criminals of all classes, and on account of their inaccessibility, form splendid hiding places for all who are engaged in the violation of the law.

Very respectfully.

MELVIN C. HAZEN,
Surveyor.

ASSISTANT TO THE ENGINEER COMMISSIONER.

REPORT OF MUNICIPAL ARCHITECT.

WASHINGTON, *August 29, 1921.*

SIR: I have the honor to submit the twelfth annual report of the office of the municipal architect for the fiscal year ending June 30, 1921.

During the year nine buildings were under construction, as follows:

Deanwood School, No. 152, located at the corner of Whittingham and Lane Places NE. Appropriation: Contractual limit, for an eight-room building, including purchase of additional land, \$190,000. Amount appropriated, \$190,000. Contract was executed July 30, 1920, for the construction of an addition of four rooms and the making of certain alterations in the old building. This work was completed February 9, 1921, at a cost of \$51,527.64.

Petworth School, No. 131, located at Shepherd and Eighth Streets NW. Appropriation: Contractual limit, \$218,000. Amount appropriated, \$218,000. Contract was executed July 17, 1920, for the construction of an eight-room addition to this building. The work was practically completed August 2, 1921, at a cost of \$171,930. The contract for the heating work for this building was executed October 7, 1920, the contract price therefor being \$36,938. The contract time for the heating expires October 11, 1921.

New Eastern High School, No. 176, located on East Capitol Street between Seventeenth and Eighteenth Streets NE. Appropriation: Contractual limit, \$1,500,000. Appropriated, \$640,000. Contract was executed September 10, 1920, for the work of making excavations for this building. This work was completed January 29, 1921, at a cost of \$41,011. Contract was executed January 28, 1921, for the construction of the foundations and substructure of this building, in the sum of \$295,940. The contract time for this work expires September 1, 1921, but application has been made for an extension of 90 days for the completion of the work.

John Burroughs School, No. 177, located on Monroe Street, between Eighteenth and Twentieth Streets NE. Appropriation: Contractual limit, \$218,000. Amount appropriated, \$210,000. Contract was executed December 19, 1920, for the construction of an eight-room addition to this building. The construction of the building to date has cost \$167,086. Two boilers were purchased for the heating equipment, the cost of the same including hauling to building being \$3,047.50. The contract time for the work on this building expires October 29, 1921.

Takoma School, No. 118, located at Piney Branch Road and Dahlia Street NW. Appropriation: Contractual limit, \$218,000. Amount appropriated, \$185,000. Contract was executed January 5, 1921, for the construction of an eight-room addition. The cost of the construction to date, including heating system, is \$161,653. The contract time for this work expires September 8, 1921.

Burrville School, No. 170, located at Division Avenue and Hayes Street, Burrville, D. C. Appropriation: Contractual limit, \$210,000. Amount appropriated, \$210,000. Contract was executed February 9, 1921, for the construction of an eight-room addition. The cost of the construction of the building to date is \$143,692. The contract time expires October 7, 1921. Contract for the heating system was executed April 8, 1921, and the cost of this installation to date is \$25,500. The contract time for the heating work expires September 10, 1921.

Joseph Rodman West School, No. 163, located on Farragut Street, between Thirteenth and Fourteenth Streets NW. Appropriation: Contractual limit, \$218,000. Amount appropriated, \$200,000. Contract was executed February 23, 1921, for the construction of an eight-room addition to this building. The construction cost to date is \$141,287. The contract time expires October 17, 1921. Contract for the heating system for this building was executed August 2, 1921, in the sum of \$22,280. The contract time for this work expires September 17, 1921. Contract for the electrical work for this building was executed April 5, 1921. The cost thereof to date is \$1,940. The contract time expires August 25, 1921.

National Training School for Girls, located at Reservoir and Conduit Roads. Appropriation, \$40,000. Contract was executed March 19, 1921, for the construction of a girls' cottage, in the sum of \$31,796. The time for the completion of this work expires September 22, 1921.

Gallinger Hospital, located on Massachusetts Avenue, between Eighteenth and Twentieth Streets SE. Appropriation: Contractual limit, \$1,500,000. Appropriated, \$1,103,590. Contract was executed September 24, 1920, for the construction of the psychopathic group of buildings. The cost of this construction to date is \$795,383.98. The contract time for work expires October 14, 1921. Contract was executed May 19, 1921, for making excavations and constructing foundations, substructures, and pipe tunnels for the power house and domestic building. The cost of this work to date is \$149,209. The contract time for this work expires November 20, 1921. Contract was executed May 2, 1921, for construction of the underground sewerage and drainage system for the psychopathic group of buildings. The cost of this work is \$7,345. The work under this contract was completed July 30, 1921. Contract was executed April 16, 1921, for electric lighting, power, and telephone wiring for the psychopathic group of buildings. The cost of this work to date is \$12,575. The contract time expires August 27, 1921.

Besides the plans and specifications for the above-named buildings, plans, and specifications for 40 other pieces of work, such as heating systems in engine houses, repairs to heating system in school buildings, etc., were prepared in this office.

Public schools, District of Columbia, 1921, repairs to buildings.

Appropriation.....	\$200,000.00
Ten per cent for supervision on outside work ¹	2,210.31
Equipment and stock on hand June 30, 1921.....	70,177.29
Total.....	272,387.60
Expended as follows:	
Carpentering.....	\$30,010.78
Tinning.....	22,801.67
Heating, steam and hot air.....	50,895.34
Plumbing.....	9,730.21
Painting.....	22,162.19
Glazing.....	5,232.21
Grading.....	15,363.35
Gas and electric work.....	8,254.00
Miscellaneous (this item includes time of all drivers)....	26,614.29
Gas, electricity, ice, coal, telephones, and car tickets (pro rata share).....	1,354.48
Forage.....	5,605.19
Engineer stable (pro rata share).....	717.14
Shop forms and upkeep of 1617 U Street.....	832.92
Sand wharf (pro rata share).....	82.81
Equipment and stock on hand June 30, 1921.....	72,480.77
Balance.....	250.25
	272,387.60

¹ We do not charge 10 per cent for supervision on work under continuous appropriations over which the municipal architect has charge.

Fire department, District of Columbia, 1921, repairs to engine houses.

Appropriation.....		\$16,000.00
Expended as follows:		
Carpentering.....	\$5,033.77	
Tinning.....	2,803.11	
Heating.....	1,349.99	
Plumbing.....	1,400.94	
Painting.....	1,557.42	
Glazing.....	232.28	
Grading.....	206.15	
Gas and electric work.....	1,044.50	
Miscellaneous.....	193.10	
Pro rata charge for the upkeep of the engineer stables, telephones, gas, electricity, ice, forage, coal, and main- tenance of automobiles.....	771.05	
Stock on hand.....	1,404.17	
Balance.....	3.52	
		<hr/> 16,000.00

Metropolitan police, District of Columbia, 1921, repairs to stations.

Appropriation.....		\$8,000.00
Expended as follows:		
Carpenter work.....	\$1,261.14	
Tinning.....	547.96	
Heating.....	3,869.19	
Plumbing.....	606.10	
Painting.....	348.34	
Glazing.....	62.93	
Grading.....	159.33	
Gas and electrical work.....	280.45	
Miscellaneous.....	167.00	
Pro rata charge for the engineer stables, telephones, gas, electricity, ice, forage, coal, and maintenance of auto- mobiles.....	570.00	
Stock on hand.....	91.23	
Balance.....	36.33	
		<hr/> 8,000.00

Courts, District of Columbia, 1921, repairs to buildings.

Appropriation.....		\$5,000.00
Expended as follows:		
Carpentering.....	\$163.50	
Tinning.....	2,403.49	
Heating.....	77.84	
Plumbing.....	92.92	
Painting.....	928.62	
Glazing.....	4.86	
Gas and electrical work.....	922.47	
Miscellaneous.....	.90	
Stock on hand June 30, 1921.....	400.95	
Balance.....	4.45	
		<hr/> 5,000.00

Work in addition to that on "Public schools, District of Columbia, 1921, repairs to buildings;" "Fire department, District of Columbia, 1921, repairs to engine houses;" "Metropolitan police, District of Columbia, 1921, repairs to stations;" "Courts, District of Columbia, 1921, police court, repairs to building."

Juvenile court.....	\$159.10
Municipal court.....	109.60
Schools (other than repairs to buildings).....	4,364.61
Playgrounds.....	416.55
Fire department (other than repairs to engine houses).....	1,137.72
Police (other than repairs to stations).....	2,462.36
Health department.....	1,029.81
Water department.....	319.43
Washington Asylum and Jail.....	2,216.51
Tuberculosis Hospital.....	101.92
Industrial Home School.....	1,990.68
Municipal lodging house.....	76.80
National Training School for Girls.....	846.97
Public convenience stations.....	1,349.55
Library.....	2,004.59
Markets.....	1,589.19
Coroner's office.....	897.63
Board of charities.....	473.10
Emergency fund.....	112.95
Electrical department.....	47.65
Parking commission.....	65.94
Improvements and repairs, streets.....	169.92
Sewers.....	160.48
Work on various construction jobs under continuous appropriations.....	43,761.07
Total.....	65,864.13

NOTE.—The above represents work which was done by this shop during the fiscal year 1921, upon written requests from the officials in charge of the various appropriations.

INSPECTION OF STEAM BOILERS.

During the fiscal year 1921 the District of Columbia repair shop inspected and repaired the steam boilers in 89 buildings owned by the District of Columbia.

Respectfully,

SNOWDEN ASHFORD,
Municipal Architect.

The ASSISTANT ENGINEER COMMISSIONER.

REPORT OF CONSTRUCTING ENGINEER, DISTRICT OF COLUMBIA WORKHOUSE AND REFORMATORY.

LORTON, VA., *August 31, 1921.*

SIR: Following is the constructing engineer's report for the year ending June 30, 1921, for the workhouse and reformatory of the District of Columbia.

Conditions at the reformatory and the workhouse as regards the number and class of prisoners received during the past fiscal year were practically the same as noted in the last annual report.

The cost of each job of repair or construction for both the reformatory and the workhouse may be obtained in detail by a very laborious process of eliminating requisitions and charges for material and labor expended for maintenance, upkeep repairs, and construction not properly chargeable to permanent construction at the reformatory or repairs and construction at the workhouse.

A brief summation of each job follows:

Work at the District of Columbia Reformatory.

PERMANENT CONSTRUCTION.

Title.	Number of days prison labor.	Number of brick.	Cubic yards of sand and gravel.	Paid labor.	Bought material.	Cost previously reported.	Total chargeable to the appropriation.
Permanent buildings.....	8,508	335,900	350	\$5,825.94	\$14,407.95	\$793.58	\$21,027.47
Locomotive house.....	(1)	27,350	12	8.00	643.02	46.53	697.55
Totten house.....	188			129.03	354.80	1,078.70	1,562.53
Pollock house.....	(1)			(1)	105.84	3,204.26	3,310.10
Officer's residence No. 1.....	10			8.00	27.00	2,864.83	2,899.83
Physician's residence.....	340	2,500		372.31	2,881.60	10,166.98	13,420.89
Chief clerk.....	198			359.15	885.64	1,022.35	2,267.14
Railroad ²	2,603	15,960	19	1,372.54	10,073.19	7,077.49	18,523.22
Hogpens.....	319				352.88		352.88
Constructing engineer's Ford truck.....					109.87	947.45	1,057.32
Chargeable to permanent.....							65,118.93

¹ See workhouse report.

² See also workhouse report.

CONSTRUCTION AND REPAIR FOR ADMINISTRATION AND UPKEEP.

.....	2,399	\$500.65	\$3,729.45	\$4,230.10
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CENTRAL POWER PLANT.

.....	¹ 38	² \$2,332.02	² \$8,334.63	² \$39,995.42	² \$50,664.51
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³ See also workhouse report.

Work at the District of Columbia Workhouse.

Title.	Number of days prison labor.	Number of brick.	Cubic yards of sand and gravel.	Paid labor.	Bought material.	Cost previously reported.	Total chargeable to the appropriation.
Central power plant.....	614			\$231.13	(1)	.....	\$231.16
Two-family brick cottage.....	849	84,850	42	2,328.68	¹ \$2,299.39	\$68.75	4,696.82
Locomotive house.....	469			¹ 1,120.95	217.00	.....	1,337.95
Repairs at the brickyard.....	272			769.37	2,678.34	.....	3,447.71
Superintendent's residence.....	83			252.62	718.02	.....	970.64
Physician's residence.....	111			261.15	(1)	(1)	261.15
Tug Louise.....	8			119.92	539.02	.....	658.94
Ninth Street wharf.....	20			441.24	573.34	.....	1,014.58
New boiler house.....	227			450.54	1,892.03	2,395.17	4,737.74
Work at shipyard.....	367			605.33	4,198.86	.....	4,804.19
Work on railroad and railroad trestles.....	1,592			1,578.61	793.70	925.53	3,297.84
Assistant superintendent's residence.....	42			155.05	267.77	.....	422.82
Fruit cellar.....	125	12,000	20	297.28	314.15	663.88	1,275.31
Female department.....	157			316.88	329.91	.....	646.79
Reformatory.....	56			233.35	.....	.....	233.35
Breeching Pollock house.....	34			¹ 98.68	(1)	(1)	98.68
Total.....							28,135.67

CONSTRUCTION AND REPAIR FOR ADMINISTRATION AND UPKEEP.

.....	2,690	500	3	\$7,309.45	\$5,804.33	\$13,113.78
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Total chargeable to the appropriations this year..... \$41,249.45

¹ See reformatory report.

Respectfully submitted.

C. B. BACKUS,
Constructing Engineer.

The MUNICIPAL ARCHITECT.

REPORT OF THE INSPECTOR OF BUILDINGS.

WASHINGTON, July 30, 1921.

SIR: I submit herewith annual report covering the transactions of the building division during the fiscal year ended June 30, 1921.

No report of Federal Government operations has been received during the year.

Statement of permits issued from July 1, 1920, to June 30, 1921.

	Num- ber.	Value.		Num- ber.	Value.
Brick:			Concrete:		
Repairs.....	1, 878	\$2, 467, 070	Dwellings.....	5	\$21, 150
Dwellings.....	467	4, 577, 100	Apartment.....	1	35, 000
Apartments.....	13	2, 054, 000	Garages.....	32	46, 240
Stores.....	63	381, 900	Lunch room.....	1	700
Warehouses.....	10	177, 600	Shed.....	1	200
Garages.....	575	676, 247	Gas station.....	1	1, 200
Automobile college.....	1	160, 000	Warehouse.....	1	35, 000
Banks.....	3	120, 000	Ice plant.....	1	90, 000
Factory and bottling works.....	1	50, 000	Store.....	1	1, 200
Manufacturing plant.....	1	50, 000	Storage houses.....	2	1, 350
Newspaper office.....	1	750, 000	Shipping room.....	1	6, 000
Post office.....	1	1, 250	Repairs.....	5	194, 650
Churches.....	8	734, 360	Sand and gravel bin.....	1	5, 000
Convent.....	1	30, 000	Metal:		
Hotel.....	1	400, 000	Garages.....	1, 402	306, 061
Sheds.....	3	700	Sheds.....	42	150, 190
School.....	1	225, 000	Tanks.....	11	7, 000
Dormitory.....	1	68, 000	Warehouse.....	1	10, 000
Auditorium and office.....	2	60, 000	Repairs.....	1	75
Clubhouses.....	2	850, 000	Frame:		
Service station.....	1	110, 000	Sheds.....	431	36, 613
Gas stations.....	2	2, 500	Repairs.....	693	21, 705
Offices.....	7	97, 000	Dwellings.....	294	1, 499, 920
Office buildings.....	3	259, 000	Garages.....	165	41, 555
Printing Office.....	1	8, 500	Store.....	1	1, 500
Moving-picture theaters.....	2	206, 500	Dormitory.....	1	4, 000
Theaters.....	3	380, 000	Parish Hall.....	1	3, 000
Store and apartments.....	3	41, 500	Hay barracks.....	1	200
Store and dwellings.....	14	148, 600	Church.....	1	300
Storage plant.....	1	25, 000	Vinegar tanks.....	5	10, 000
Substation.....	1	9, 100	Barn.....	1	1, 950
Work-shop.....	1	300	Machinery:		
Ice warehouse.....	1	125, 000	Elevators.....	83	366, 290
Cow barn.....	1	1, 000	Motors.....	610	301, 340
Wagon shop.....	1	1, 500	Boilers.....	4	1, 100
Store and office buildings.....	2	240, 000	Total.....	6, 928	18, 999, 926
Stables.....	3	1, 250	Awnings.....	139	10, 425
Transforming station.....	1	200	Signs.....	1, 494	11, 940
Hollow tile:			Grand total.....	8, 561	19, 025, 291
Dwellings.....	6	44, 400			
Garages.....	35	36, 500			
Repairs.....	3	25, 760			
Studio.....	1	5, 000			
Shed.....	1	600			

The following summary shows the distribution of improvements in the respective sections of the District and the values of same:

	Buildings.	Repairs, etc.
Northeast.....	\$414, 330	\$383, 388
Southeast.....	569, 015	203, 680
Northwest.....	5, 578, 708	2, 612, 344
Southwest.....	125, 650	74, 162
County.....	8, 163, 814	844, 835
Total.....	14, 881, 517	4, 118, 409
Sum total ¹.....	4, 118, 409	
	18, 999, 926	

¹ Does not include awnings or signs, the values of which are estimated.

Grand total for all building operations, \$19,025,291.

Comparative statement for years 1920 and 1921.

	New buildings.	Repairs, etc.	Dwellings.	Apart- ments.	Business buildings.
1921.....	1,605	5,323	772	14	819
1920.....	2,346	4,506	1,124	26	1,196
	¹ 741	² 817	¹ 352	¹ 12	¹ 377

¹ Decrease.² Increase.

Valuation of building operations, including awnings and signs:

1921.....	\$19,025,291
1920.....	22,659,452

Decrease.....

3,634,161

Permits issued, number of, including awnings and signs:

1921.....	8,310
1920.....	7,525

Increase.....

785

Estimated number of buildings in the District of Columbia.

	Brick.	Tile.	Concrete.	Stone.	Frame.
1921, erected.....	1,209	43	48	.....	305
1921, razed.....	76	.....	.....	.....	148
	1,133	43	48	.....	157
1920.....	68,127	226	61	2	27,181
Total estimated number standing.....	69,260	269	109	2	27,338

The act to regulate the height, area, and use of buildings in the District of Columbia and to create a zoning commission was approved March 1, 1920, and the regulations provided for thereunder became effective August 30, following.

During the ensuing 10 months there were issued 4,150 conforming certificates of occupancy and 450 nonconforming certificates, the fees therefor totaling \$2,400.

The general and commendatory acceptance of the zoning regulations, considering their revolutionary character as affecting building operations and the uses of buildings, has been quite as gratifying as noteworthy. A thoroughly satisfactory administration in this respect, however, is defeated by reason of an inadequate working force, those employees temporarily assigned to this division from other departments being frequently recalled about the time they have become familiarized with the regulations and duties relating thereto. The personnel of this office should be permanently augmented to a quota sufficient to cope smoothly and promptly with the situation.

Inspection of boilers.

Boilers inspected.....	476
Boilers inspected for the District of Columbia (no fees).....	30
Boilers condemned as unfit for further use.....	2
Cases of scale and deposit.....	46
Cases of defective setting.....	20
Cases of defective steam gauges.....	7
Cases of defective tubes.....	96
Cases of defective shell plates.....	65
Cases of working pressure reduced.....	11
Total amount received.....	\$2,380
Total amount expended.....	350
	<hr/> \$2,030

Very respectfully,

JOHN P. HEALY,
Inspector of Buildings.

ASSISTANT TO THE ENGINEER COMMISSIONER.

REPORT OF THE PERMIT CLERK, ENGINEER DEPARTMENT.

WASHINGTON, August 29, 1921.

SIR: I have the honor to submit the following report of the permit clerk's office, giving the number of permits issued during the fiscal year ended June 30, 1921:

Water connections.....	1,035
Repairs.....	725
Specials (no fee).....	124
Sewer connections.....	1,056
Repairs.....	739
Specials (no fee).....	891
Gas mains and connections.....	1,095
Repairs.....	294
Specials (no fee).....	14
Electric construction, underground connections.....	2,078
Repairs.....	36
Conduits.....	326
Manholes.....	127
Automobile pipe lines and private conduits.....	14
Fences to inclose parkings.....	581
Guard stones in alleys.....	7
Poles—erect, replace, and move.....	664
Miscellaneous.....	22
Permits for the various kinds of work in public space.....	2,971
Total permits issued.....	<hr/> 12,799

Fees of \$1 each were paid for 8,799 and fees for which no fees were paid 4,000.

Three thousand four hundred and sixty-three files were referred to this office, record cards made, permits issued and reports made, the files indorsed and returned to the respective divisions having supervision over the inspection for which the permits were issued.

The applications for permits were sorted and filed according to location of the work, for ready reference, written report being made of all permits for excavations in the public space to the engineer of highways.

Very respectfully,

H. M. WOODWARD, *Permit Clerk.*

To the INSPECTOR OF BUILDINGS.

REPORT OF THE BOARD OF EXAMINERS OF STEAM ENGINEERS.

WASHINGTON, D. C., *August 31, 1921.*

SIR: The board of examiners of steam engineers have the honor to submit to you the report for the year ending June 30, 1921. The following table shows the work as it progressed during each month:

	Meet- ings held.	Appli- cants re- ceived.	Appli- cants ap- proved.	Appli- cants. not com- petent.	First class.	Second class.	Third class.	Gas fired for press- ing ma- chines.	Special class.
1920.									
July.....	5	17	10	7			4	5	1
August.....	4	17	8	9		1	3	4	
September.....	4	4	2	2			2		
October.....	5	17	11	6		2	5	3	1
November.....	4	18	6	12			4	2	
December.....	5	12	4	8			2	2	
1921.									
January.....	4	19	6	13		1	3		2
February.....	4	8	4	4			1	3	
March.....	4	11	4	7			3		1
April.....	5	19	9	10			4		
May.....	4	11	2	9				5	
June.....	4	15	11	4			2	9	
Total.....	52	168	77	91		4	33	35	5

Our estimate of expenses for the year ending June, 1923, has been submitted to the secretary, Board of Commissioners. We most respectfully ask that the amounts set forth be appropriated.

Respectfully submitted.

E. F. VERMILLION,
H. BOESCH,
W. I. EVANS,

Board of Examiners of Steam Engineers.

To the INSPECTOR OF BUILDINGS.

REPORT OF INSPECTOR OF PLUMBING.

WASHINGTON, D. C., *September 1, 1921.*

SIR: I have the honor to submit the thirty-ninth annual report of the plumbing inspecting division, engineer department.

During the fiscal year there were a total of 38,379 inspections made by the field force, which averaged nine men, of which 11,714, or slightly less than one-third of the total inspection, were on complaints relative to defective plumbing or defective sheet-metal work. There were, in addition, 3,371 inspections made in connection with appeals, police court work, and District construction work, making a total of 41,750 recorded inspections. This was a very great increase over the 24,505 inspections made during the previous fiscal year. Special arrangements were made to render every assistance to the construction inspectors of the municipal architect's office, and they were undoubtedly relieved of much detail work in connection with plumbing installations. This office also assisted the municipal architect with plumbing plans and specifications when requested.

The office record shows that the plumbing work in new buildings during the year amounted to \$1,370,954, and it is estimated that \$1,114,000 worth of remodeling and repair work was done, making the total of plumbing work done in the District, in private buildings, about \$2,500,000. Much plumbing work was also done in the District by the various agencies of the United States Government, but this office keeps no record thereof.

A substantial increase was noted in the amount of office work done in connection with inspection work and handling of plans and specifications, both for private work and for public construction work.

In our police court work there were a total number of 38 warrants obtained, all of them for either violation of the plumbing regulations or plumbing work done by unlicensed plumbers. A few of these cases were nolle prossed on compliance before the case came to trial, but one case was dismissed, and the balance being fined; a total of \$448 collected therefor.

There were 181 cases referred to this office by the health office and other departments for prosecution under the nuisance and drainage acts. In a great many of these cases the required repairs were made by the agent or owner after proper representation of the facts and in only 17 cases did this office finally have to do the work and assess the cost. There are still 5 cases under notice and 12 cases are being held by reason of the fact that ownership can not be properly determined or for other legal reasons.

The plumbing board held 24 meetings and examined 77 candidates, of whom 13 passed and were recommended for license. There were on June 30, 1921, 236 registered plumbers, about 195 of whom were actively engaged in business. There were also 8 registered gas fitters.

There were in operation throughout the year four convenience stations, open from 6 a. m. until midnight, with two shifts of attendants, each working 9 hours per day. The largest station, that at Seventh Street and Pennsylvania Avenue NW., accommodated 6,622,636 persons; that at Thirteen-and-a-half Street and Pennsylvania Avenue NW., 1,669,410; that at Ninth and K Streets NW., 1,427,266; that at Fifteenth and H Streets NE., 1,120,978, making a total patronage of nearly 11,000,000, this being over 900,000 a month, and 30,000 per day, 1,600 per hour.

The women used the stations a little over one-eighth as much as the men and contributed about one-tenth of the receipts. These cash receipts for the year amounted to \$8,882.17, and consisted of fees received for use of pay toilets, the rental of clean towels, commission on telephone service, weighing machines, etc., being about 45 per cent of the total cost of operation of the stations. Of the several cities exchanging records with this office some have no receipts at all by reason of the lack of any charges, and the rest average about 15 per cent of the cost of operation in receipts. I believe this showing is due to the general excellence of our stations, the service we give in our pay compartments, and the close track that is kept by means of our coin lock system.

The need for new stations is being continually pointed out and it is strongly recommended that an effort be made to enlarge the number in our business sections as soon as may be possible.

During the past year this office has lost several men by reason of the inadequate salaries, and it is most earnestly recommended that an unusual effort be made to obtain salaries for these technical men commensurate with their duties.

In consideration of the efficient and faithful service rendered by the men in this office, I recommend them to your most earnest consideration.

A. R. MCGONEGAL,
Inspector of Plumbing.

To the INSPECTOR OF BUILDINGS.

REPORT OF ASSISTANT ENGINEER COMMISSIONER WOOD.

WASHINGTON, *October 1, 1921.*

SIR: I have the honor to transmit herewith annual reports of the operations of the various divisions and offices under my immediate supervision for the fiscal year ended June 30, 1921.

Very respectfully,

JOHN ELLIOTT WOOD,
*Captain, Corps of Engineers, United States Army,
Assistant to the Engineer Commissioner.*

To the ENGINEER COMMISSIONER.

REPORT OF THE SUPERINTENDENT OF THE WATER DEPARTMENT.

WASHINGTON, *September 8, 1921.*

SIR: The annual report of the water department for the fiscal year ended June 30, 1921, is submitted herewith.

The complete reports of the subdivision heads of the department are on file in the office of the superintendent.

I again invite attention to a method of preventing water waste by both the United States Government and municipal offices, and also a method of ascertaining the value of construction work of the aqueduct office, District government, and water department, which are outlined more fully in my annual report under date of October 5, 1918.

The total length of mains laid during the fiscal year ended June 30, 1921, is 8.5 miles, making the total length of mains in service 647.5 miles.

The average daily water consumption for the year is 61,506,830 gallons, making a per capita consumption of 140.5 gallons. I am glad to report that this is approximately 1,400,000 less than the mean daily consumption of the preceding year.

I again suggest that at the earliest possible date the question be taken up of the disposal of the valuable real estate in square No. 175, bounded by Sixteenth, Seventeenth, U, and V Streets NW., as this property represents an investment of \$66,500, and is no longer used or needed by the water department. This sum could be used to advantage in making needed extensions of the distributing system.

I am very glad to report that some of the Government departments have taken initial steps to do away with the use of filtered water for condensing purposes, and am of the opinion that if the crusade against

the waste of water is continued and officials will cooperate with the District authorities many thousands of gallons of water can be saved. I wish to record my appreciation of the work done by the employees of this department.

J. S. GARLAND,

Superintendent Water Department.

ASSISTANT TO THE ENGINEER COMMISSIONER.

ENGINEERING AND CONSTRUCTION.

The work of repairing the concrete cover on the Reno Reservoir was completed during the year. The top was given slightly more pitch and a couple of ventilators were added to take care of the condensation on the underside of the concrete.

A 20-inch trunk main was laid in Illinois Avenue and Georgia Avenue, from Grant Circle to Military Road. This forms one link in a proposed line which it is intended to lay to a point beyond the Walter Reed Hospital. This water main is in the third high service, and serves a very large area of the higher sections of the District.

Twelve-inch water mains were laid as follows: F Street, from Eighth to Fourteenth streets NW.; Benning Road, east from Anacosta Road NE.; Thirteenth Street, between Hamilton and Kennedy Streets NW.; and in Webster Street, between Sixteenth and Seventeenth Streets NW.

Of these, a most important was the main laid in F Street. This main passes through the center of the business district, affording increased fire protection. The old 6-inch service main was removed and all house services were connected to the 12-inch water main.

The 12-inch water main in Bladensburg Road north and south of Queen Chapel Road NE. was lowered to meet a change in the street grade.

The cost of laying water mains will be shown in tabulated statements.

STEAM ENGINEERING.

The following is a summary of the work done at the District pumping station during the year:

Water pumped, figured from plunger displacement:

First high service.....	gallons..	6, 932, 717, 090
Second high service.....	do....	3, 358, 905, 170
Third high service.....	do....	1, 068, 270, 470
Total.....	do....	11, 359, 892, 730
Fourth high service.....	do....	81, 354, 420
Coal burned.....	tons..	7, 466
Cylinder oil used.....	gallons..	989
Engine oil used.....	do....	2, 208
Filtered oil used.....	do....	699
Turbine oil used.....	do....	859
Grease used.....	pounds..	456
Waste used.....	do....	715

The regular force employed at this station in the daily operation of the pumping engines, boilers and auxiliaries, cleaning of machinery, etc., consists of three crews of three engineers in charge, three assistant engineers, three firemen, three oilers, and three cleaners, working

in eight-hour alternate shifts, six days on duty and one day off per week, being relieved on days off by an extra engineer crew.

For the fourth high service, the water is pumped from the Reno Reservoir, which is supplied by the third high-service pumps, to an elevated tank by gasoline engines and triplex pumps. This machinery is operated daily by three enginemen who work on eight-hour shifts. The water pumped for this service during the year was 81,354,420 gallons, or a mean of 222,888 gallons daily.

The Anacostia pumping station has been operated without interruption during the year, pumping to the three towers supplying the area east of the Anacostia River. This station is taken care of by four men. The water pumped for this service during the year was 146,772,060 gallons, or a mean of 402,116 gallons daily.

The total pumpage for the year at the District pumping station was 263,322,530 gallons less than for the fiscal year 1920. The greatest amount pumped in one day (June 20) was 38,451,670 gallons, the least in one day (July 18) was 28,340,710 gallons, and the average dynamic head against pumps was 117.7 feet. The total operating expense chargeable to pumping was \$118,195.29, as against \$107,326.98 in 1920, making the total operative cost of pumping 1,000,000 gallons of water into the mains \$10.40. This is \$1.17 per million gallons more than in 1920, and is entirely due to the increased cost of labor and material. The average cost of coal for the year was \$9.20, which was \$2.14 more than in 1920.

The station duty for the year was 68,616,116 foot-pounds per 100 pounds of coal. This is 1.2 per cent more than the duty obtained during the preceding year, and represents an annual saving of approximately 134 gross tons of coal. This saving in coal may be attributed partly to a greater proportionate amount of work performed by the high-duty pumping units, and partly to improved operating conditions.

WATER SURVEYS.

Nearly 1,000,000 gallons daily underground leakage was found and stopped by routine water surveys in the gravity service represents the principal result of the activities of the division during the year. This total compares favorably with the total found last year, 1,098,912 gallons. This slight decrease may be attributed to the smaller field force and to the increased difficulties of locating small leaks. A total of 189 individual leaks represents the conditions found during the year, as against 165 during 1920.

The average leak was 5,192 gallons per day, as compared to 6,660 gallons per day of the previous year. The principal sources of waste were corroded iron service pipes wasting 252,600 gallons, defective lead service pipes, 224,600 gallons, defective wiped joints on lead services and on iron service connections at the corporation cocks, 216,000 gallons, and defective calked joints on cast-iron mains, 152,600 gallons per day. One hundred and sixty-nine thousand nine hundred and thirty gallons per day leakage not underground but of an obscure nature was found in the automatic float controlled horse fountains located throughout the city. This waste was caused by the enlargement of the orifice due to corrosion, defective ball cocks and fittings corroded by galvanic action.

Study of Statement No. 1 forming part of this report shows the interesting fact that at least 1,000,000 gallons daily underground leakage can be found each year by the present working force of this division, regardless of what section of the city is surveyed. It is also worthy of note, shown by further study of these reports, that this leakage can be found repeatedly within the same section if a lapse of one or two years is permitted between the successive surveys. In other words, it is evident that this division is finding new leaks each year which have occurred since the previous surveys in the same section. The grand total of purely underground leakage actually located, exposed, measured and remedied since this work was started in 1907 is over 49,000,000 gallons daily. Adding this to the present daily consumption of 60,000,000 gallons gives a figure somewhat startling in the present water supply situation. It is evident that the prevention of water waste, by routine water surveys, has delayed the necessity of a new tunnel for at least 10 years.

Tables giving in full detail the routine work performed are on file in the office of the superintendent.

STORES AND ACCOUNTS.

The values of material and equipment handled during the year were as follows:

Material received, \$394,546.32; issued, \$418,566.70. Equipment received, \$21,863.56; issued, \$15,038.57.

Old material was delivered to contractor to the value of \$1,736.20.

Value of material on hand at close of year was \$185,943.76 and the value of equipment in stock and in service was \$700,842.96.

Tabular statements submitted herewith showing financial condition of the department and cost of work done during the year.

STATEMENT NO. 1.—*Underground leaks, 1907-1921.*

Year.	Number.	Quantity (gallons per day).	Average (gallons per day).
1907-8.....	271	5,604,400	20,700
1908-9.....	852	9,500,000	11,500
1909-10.....	532	6,364,200	12,000
1910-11.....	624	6,921,900	11,100
1911-12.....	813	5,115,300	6,300
1912-13.....	651	4,195,100	5,400
1913-14.....	452	2,552,800	5,600
1914-15.....	385	1,828,820	4,800
1915-16.....	420	1,984,600	4,700
1916-17.....	340	1,752,750	5,155
1917-18.....	178	831,640	4,689
1918-19.....	180	1,160,510	6,447
1919-20.....	165	1,098,912	6,660
1920-21.....	187	990,430	5,192
14 years.....	6,030	49,901,362	8,276

TABLE I.—Statement of cash account of the water fund, District of Columbia, including appropriations and outstanding obligations, for the fiscal year ended June 30, 1921, as shown by the books of the auditor, District of Columbia.

Balances June 30, 1920:		
Cash in Treasury of the United States.....	\$128,314.11	
Cash on requisition to credit of disbursing officer, District of Columbia.....	36,338.11	
		\$164,652.22
Water rents.....	984,055.23	
Taps and stopcocks.....	5,736.70	
Water main assessments.....	76,933.41	
Interest.....	2,056.42	
Sales of materials.....	1,557.73	
		1,070,339.49
Repayments and credit transfers.....		82,432.91
		<u>1,317,424.62</u>
Total.....		
Expenditures for the year:		
Appropriation, water department, District of Columbia, 1921—		
Salaries—		
Revenue and inspection branch.....	38,330.36	
Distribution branch.....	55,928.97	
Contingent expenses.....	3,676.57	
Maintenance and operation.....	403,927.04	
20-inch water main.....	69,989.20	
12-inch water main.....	20,000.00	
Extension of distribution system.....	79,066.33	
Installing water meters.....	16,252.57	
Installing fire and public hydrants.....	26,916.41	
Refunds.....	5,455.42	
		719,542.87
Increase of compensation, water department.....		81,653.47
Appropriation, water department, District of Columbia, 1920:		
Salaries, distribution branch.....	41.67	
Contingent expenses.....	729.21	
General expenses.....	15,532.61	
High service.....	73,403.47	
Refunds.....	9.35	
		89,716.31
Increase of compensation, water department.....		675.03
Appropriation, water department, District of Columbia, 1919:		
Contingent expenses.....	2.00	
General expenses.....	71.74	
High service.....	336.00	
		409.74
Increase of compensation, water department.....		2.30
Appropriation, water department, District of Columbia, 1918:		
High service.....		10,632.57
Total water department expenditures.....		902,632.29
Advances, account appropriations:		
Washington Aqueduct, District of Columbia, 1921....	158,000.00	
Increase of compensation, Washington Aqueduct.....	18,000.00	
Washington Aqueduct, District of Columbia, 1920....	9,395.08	
		185,395.08
Balances June 30, 1921:		
Cash in Treasury of the United States.....	179,474.80	
Cash in hands collector of taxes, District of Columbia..	1,935.74	
Cash on requisition to credit of disbursing officer, District of Columbia.....	47,986.71	
		229,397.25
Total.....		<u>1,317,424.62</u>

Balance in water fund as stated above.....	\$229,397.25
Less obligations against appropriations:	
Water department, District of Columbia, 1921—	
Contingent expenses.....	\$968.81
Maintenance and operation.....	22,872.52
Installing water meters.....	1,541.86
Extension distribution system.....	153.15
Installing fire and public hydrants.....	13,022.00
Water department, District of Columbia, 1920—	
Contingent expenses.....	4.70
General expenses.....	51.53
High service.....	2,888.86
	<hr/> 41,503.43
Unobligated balance, water fund, June 30, 1921.....	187,893.82

TABLE II.—Cost of work done by the water department for the year ended June 30, 1921.

Heads of expenditure.	Per diem and salaries.	Material expended, cuts, transportation, etc.	Total expenditure.	Charged to general account.		Stable and deposit accounts, Dr.
				Maintenance.	Extensions.	
Water surveys (detection of leaks).....	\$25,035.49	\$4,256.98	\$29,292.47	\$29,292.47		
Maintenance of meters.....	18,516.63	13,218.52	31,765.15	31,765.15		
Installation of meters.....	5,983.05	10,848.48	16,831.53			\$16,831.53
Office of water registrar.....	65,385.27	4,749.85	70,135.12	70,135.12		
Inspection and repair of services.....	27,417.72	6,721.26	34,138.98	34,138.98		
Tapping water mains.....	3,557.36	3,791.36	7,348.72			7,348.72
New service installed.....	679.40	587.53	1,266.93			1,266.93
Engineering (field surveys).....	20,330.42	1,364.73	21,695.15			21,695.15
Stable account.....	11,293.09	5,165.96	16,459.05			\$16,459.05
Operation and repair of valves, fire hydrants, etc.....	23,153.97	4,537.63	27,691.60	27,691.60		
Installation of fire and public hydrants.....	5,042.90	13,639.36	18,682.26			18,682.26
Water mains laid.....	44,796.69	145,375.25	190,171.94			190,171.94
Repairs to leaks.....	19,065.89	7,361.29	26,427.18	26,427.18		
Maintenance of reservoirs, lodges, and towers.....	6,899.85	3,241.21	10,141.06	10,141.06		
Care of grounds.....	6,763.04	174.24	6,937.28	6,937.28		
Repayment and deposit work.....	15,600.57	20,491.16	36,091.73			36,091.73
Replacement work, lowering mains, etc.....	6,375.24	12,890.05	19,235.29	19,235.29		
Plans, estimates and tests.....	13,664.04	229.92	13,893.96	9,110.27		4,783.69
Care of Bryant Street pumping station.....	21,665.15	4,416.90	26,082.05	26,082.05		
Operation and repair, pumps, Bryant Street station.....	43,547.65	87,254.97	130,802.62	130,802.62		
Operation and repair, pumps, Reno station.....	4,545.19	1,972.98	6,518.17	6,518.17		
Operation and repair, pumps, Anacostia station.....	6,977.15	3,637.63	10,614.78	10,614.78		
Shopwork.....	25,240.22	28,112.48	53,352.70	53,352.70		
Furnished other District of Columbia offices.....	4,357.21	105.62	4,462.83	4,462.83		
Gross expenditures.....	425,893.19	384,145.36	810,038.55	496,707.55	260,780.22	52,550.78

SUMMARY.

Expenditures:		Charged to:		Per cent.
Per diem pay rolls.....	\$334,828.60	Maintenance.....	\$496,707.55	65.6
Salary pay rolls.....	94,064.59	Extensions.....	260,780.22	34.4
Total services.....	425,893.19			
Material expended, cuts, etc.....	384,145.36			
Gross expenditures.....	810,038.55			
Less transportation and repayment credits.....	52,550.78			
Net expenditure.....	757,487.77		757,487.77	100.0

TABLE III.—Statement of the distribution system, including mains laid by the United States, the District of Columbia, and on account of repayment work.

Diameter.	In service June 30, 1920.	Laid during year ended June 30, 1921.	Abandoned during year ended June 30, 1921.	In service June 30, 1921.
3-inch.....linear feet.....	83,751	997	.....	84,748
4-inch.....do.....	155,708	354	1,095	154,967
6-inch.....do.....	1,467,732	859	1,981	1,466,610
8-inch.....do.....	918,179	26,950	132	944,997
10-inch.....do.....	9,107	.....	.....	9,107
12-inch.....do.....	401,344	8,994	.....	410,338
16-inch.....do.....	26,018	.....	.....	26,018
20-inch.....do.....	114,064	5,666	.....	119,730
24-inch.....do.....	34,766	1,359	.....	36,125
30-inch.....do.....	58,000	.....	.....	58,000
36-inch.....do.....	59,433	.....	.....	59,433
42-inch.....do.....	23	.....	.....	23
48-inch.....do.....	44,172	.....	.....	44,172
75-inch.....do.....	600	.....	.....	600
Total.....	3,372,897	43,179	3,208	3,414,868
Stop valves.....	11,004	216	67	11,153
Fire hydrants.....	3,649	157	76	3,730
Public hydrants.....	232	19	13	238
Sanitary fountains.....	17	.....	.....	17
Horse fountains.....	157	1	4	154
Public wells.....	44	.....	.....	44

TABLE IV.—Statement of the length and cost of water mains laid from July 1, 1878, to June 30, 1921, paid from water department funds.

Diameter.	In service June 30, 1920.	Laid during year ended June 30, 1921.	Abandoned during year ended June 30, 1921.	In service June 30, 1921.
3-inch.....linear feet.....	76,822	337	.....	77,159
4-inch.....do.....	117,484	.....	1,095	116,389
6-inch.....do.....	1,079,532	286	1,981	1,077,737
8-inch.....do.....	858,932	26,742	132	885,542
10-inch.....do.....	6,739	.....	.....	6,739
12-inch.....do.....	352,079	8,807	.....	360,886
16-inch.....do.....	18,870	.....	.....	18,870
20-inch.....do.....	102,970	5,666	.....	108,636
24-inch.....do.....	14,494	1,359	.....	15,653
30-inch.....do.....	20,437	.....	.....	20,437
36-inch.....do.....	38,244	.....	.....	38,244
42-inch.....do.....	23	.....	.....	23
48-inch.....do.....	14,309	.....	.....	14,309
Total.....	2,700,935	43,197	3,208	2,740,924

Total cost to June 30, 1920.....\$4,139,194.16

Total cost for year ended June 30, 1921.....190,171.94

Aggregate cost to June 30, 1921.....4,329,366.10

REPORT OF THE WATER REGISTRAR.

WASHINGTON, September 1, 1921.

SIR: I submit herewith the annual report of the revenue and inspection branch of the water department, showing in detail the work accomplished during the year ended June 30, 1921.

INSTALLATION OF WATER METERS.

The increased cost of meters, labor, and material, as well as the scarcity of labor, precluded the possibility of extensive metering

during the year, and the work of installation consisted only of metering the services of some of the new houses in those sections which had been previously metered. The number of meters installed during the year was 974 and the number discontinued was 60, making the total now in use 62,279.

LEAKS AND WASTES.

During the year 14,475 examinations for leaks were made. This included ordinary leaks at house fixtures and the more complicated cases of underground leaks, the detection of which required considerable time and the employment of experienced men, and very fortunately the office was able to maintain a force qualified for the purpose through the most trying times that have yet been experienced.

In all 250 water services were discontinued at the tap in the main. The water supply was cut off from 200 houses this year during the period of vacancy, which has prevented the reoccupying of the houses without the knowledge of the office, thus preventing a loss of revenue.

SERVICE CONNECTIONS.

There were 1,101 new service connections made, inspected, and locations recorded during the year; also, 711 repairs, etc., to water services and appurtenances were inspected and recorded.

This work was handled by the regular inspector with some assistance from the office force, and inspections have been made in the majority of cases within one hour of the time specified by the plumber doing the work.

Owing to the reduction in the number of new service connections the tapper has been used in connection with leaks and wastes and the taking out and replacing of meters, thus keeping these branches of the work up to date. This detail did not occasion any loss of time in connection with the tapping of water mains, and saved the employment of more men in the subdivision to which the assistance was given.

REVENUES.

The table of comparative revenues shows a total collection of \$1,142,525.79.

Table 1 shows statement of collections and expenditures.

Table 2 shows comparative statement of revenues.

Table 3 shows general information.

INCREASE OF WATER RATES.

Under the act of Congress approved June 5, 1920, the water rates were increased 25 per cent to take effect July 1, 1920.

According to the new schedule, on all tenements two stories high with a frontage of 16 feet or less, \$6.25 per annum; for each additional front foot, or fraction thereof greater than one-half, 39 cents. For each additional story or part thereof, one-third of the charges as computed above.

Business premises are rated according to their size, class, volume of business, and water facilities, and rate from \$1 to \$25. If the flat rate

on business establishments reaches \$25 or more, the owner or occupant is required to install a water meter at his own expense.

A minimum rate of \$5.65 will be charged against all consumers supplied with water through meters, which allows the use of 7,500 cubic feet of water during the year; water used in excess thereof will be charged for at the rate of 5 cents per 100 cubic feet.

CONDITION OF THE WORK.

Notwithstanding the fact that there has been a large increase in business over that of previous years, owing to the growth of the population, the condition was met without any addition to the force and the work was up to date at the close of the year.

This result was obtained by the faithful cooperation of the employees, for which I now take pleasure in expressing my appreciation.

GEO. W. WALLACE,
Water Registrar.

The SUPERINTENDENT, WATER DEPARTMENT.

TABLE 1.—*Statement of collections.*

Water rents:	
Flat rate.....	\$109,840.95
Meters.....	870,924.79
Building purposes.....	3,289.49
Total.....	984,055.23
Water-main tax, principal and interest.....	78,989.83
Taps and stopcocks.....	5,734.70
Miscellaneous receipts.....	1,557.73
Total.....	86,282.26
Total receipts.....	1,070,337.49
Repayments, deposits, etc.....	72,188.30
Total receipts and repayments.....	1,142,525.79

TABLE 2.—*Statement of cash receipts and expenditures of the water fund, District of Columbia, for the fiscal years from June 30, 1912, to June 30, 1921.*

Year.	Water rents.	Water-main tax, principal and interest on same.	Taps and stopcocks.	Miscellaneous receipts.	Repayments, deposits, etc.	Total receipts and repayments.
1912.....	\$545,405.47	\$122,458.81	\$11,438.65	\$2,817.50	\$110,441.39	\$792,561.82
1913.....	640,008.64	138,693.57	8,685.50	3,153.81	14,923.91	805,465.43
1914.....	646,296.15	86,379.21	6,118.20	4,253.20	24,131.64	767,178.40
1915.....	638,861.89	66,107.56	6,559.89	3,532.77	14,513.50	729,575.61
1916.....	624,882.18	64,647.80	7,020.80	1,761.39	24,669.76	722,981.93
1917.....	636,664.31	61,990.43	5,484.62	2,019.58	25,551.56	731,710.50
1918.....	714,388.28	34,649.46	3,705.65	458.96	44,391.59	797,593.94
1919.....	782,159.36	28,179.43	4,810.28	1,482.58	109,837.37	926,469.02
1920.....	771,161.55	43,121.19	6,906.47	1,164.01	32,272.23	854,625.45
1921.....	984,055.23	78,989.83	5,734.70	1,557.73	72,188.30	1,142,525.79
Total.....	6,983,883.06	725,217.29	66,464.76	22,201.53	472,921.25	8,270,687.89
1922 ¹	969,000.00	60,000.00	7,000.00	1,000.00	.....	² 1,037,000.00
1923 ¹	960,000.00	60,000.00	6,000.00	1,000.00	.....	² 1,027,000.00

¹ Estimated.

² Estimated total revenue.

TABLE 3.—General information.

Average cost of installing a water meter by the department:				
Meter.....				\$12.00
Material.....				6.41
Labor.....				6.14
Total.....				22.55
Cost of labor and material for maintenance of meters.....				31,765.15
Average cost per meter for maintenance.....				.51
Consumption of water through meters:				Cubic feet.
District meters.....				628,419,600
District meters in municipal buildings.....				65,065,000
Private meters.....				773,015,500
Private meters in charitable institutions.....				25,808,700
Total.....				1,512,338,800
Meters in service.	In use June 30, 1920.	Installed, 1921.	Aban- doned, 1921.	Total in use June 30, 1921.
District meters.....	58,088	955	53	58,990
District meters in municipal buildings.....	264			264
Private meters.....	2,825	17	5	2,837
Private meters in charitable institutions.....	188	2	2	188
Total.....	61,355	974	60	62,279
Average cost of reading meters.....				\$0.20
Average cost of computing and making bills.....				.22
Average payment for premises in which meters were installed.....				8.12
Average payment for flat-rate accounts.....				10.34
Difference.....				2.22
Premises which receive an allowance of free water:				
Number of institutions.....				158
Number of meters.....				188
Cubic feet of water consumed.....				25,808,700
Allowance of free water, cubic feet.....				41,570,130
Number of institutions exceeding allowance.....				36
Revenue:				
For metered water—				
District of Columbia meters.....			\$479,049.50	
Private meters.....			391,875.29	
				\$870,924.79
For flat-rate accounts—				
Water rents.....			109,840.95	
Building purposes.....			3,289.49	
				113,130.44
Total revenue for fiscal year 1921.....				984,055.23
Water services:				
In use June 30, 1920.....				72,149
Installed, 1921.....				1,101
Total.....				73,250
Abandoned, 1921.....				352
In use June 30, 1921.....				72,898
Metered.....				62,279
Difference.....				10,619
Percentage of services metered.....				85

REPORT OF THE SANITARY ENGINEER.

WASHINGTON, D. C., August 9, 1921.

SIR: In submitting this my fourteenth and last annual report, covering the fiscal year ending June 30, 1921, it is considered important to direct your attention to need of continuing the work on the construction of the upper Potomac and the main Anacostia intercepting sewers, items for which were included in the estimates recently submitted for the next fiscal year. In the last annual report this need was unavailingly set forth at some length. Within

a few years funds will be required for beginning the sewage-treatment works, and logically these interceptors should first be completed. If the demands for economy require a reduction of the very moderate sums just submitted for all classes of sewerage works it would appear to be the part of wisdom not to entirely eliminate either of these important items, but to allow a smaller sum for each, even though it were necessary to reduce by a corresponding amount the allowance for main and pipe, suburban, and assessment and permit sewers.

In accordance with the demand for extreme economy in space, to save expenditure for printing, the briefest possible record will be made of the year's activities.

SECTION A. ENGINEERING DATA, DESIGNS, AND DRAINAGE STUDIES.

The data for the year were much curtailed by lack of funds and personnel. Bacteriological examination of park streams and oxygen tests of river waters, both indicate the effect of increasing pollution.

The river flow, which measures the capacity for the present sewage disposal by dilution, fell below 2,000 second-feet for 2 days, below 2,200 second-feet for 6 days, below 2,400 second-feet for 15 days, with a minimum flow of 1,850, a maximum flow of 58,500, and a mean for the year of 9,150 second-feet.

Rainfall data were continuously recorded for the year at 4 automatic and 21 pot gauges. There were no storms of extraordinary intensity.

Studies were made for a number of new drainage projects.

The Rock Creek pumping station was completed, including the mechanical installation, and began the delivery to the disposal system of the sanitary drainage of the upper Potomac on June 15, 1921.

SECTION B. OPERATION AND MAINTENANCE, SEWERAGE SYSTEM.

Operating activities for the year included the inspection of the interior of 149.29 miles of trunk sewers and the inspection of 1,047.3 miles of pipe sewers. It included also the cleaning of 31.7 miles of sewers at a cost of \$7,383.80; the flushing of about 1,000 miles of pipe sewers at a cost of \$4,062.51; the cleaning of 29,354 city storm-water catchment basins and removing 4,850 tons of silt therefrom at a cost of \$22,470.86; and the cleaning of 5,895 suburban storm-water catchment basins and the removal of 3,760 cubic yards of silt therefrom at a cost of \$6,159.80. Chargeable to mosquito prevention 22,981 storm-water catchment basins were specially flushed and treated with mosquito oil during the summer months at a cost of \$1,064.50. The maintenance work for the year included the making of all immediately necessary repairs throughout the trunk sewer system as rapidly as reported from the inspection force engaged in the examination of the interior of the 149 miles of trunk sewers. In a number of cases, however, repairs were of little value on account of the fact that the very old trunk sewers, built 50 to 75 years ago, of brick laid in lime mortar are beyond the stage of repairing and should be reconstructed. Expenditure on work of this character is a waste of public funds that may be expressed as the extortionate rate of interest on the capital necessary to install new and modern structures that for many years would require no expenditure for

maintenance. All necessary repairs throughout the system were made on the pipe sewers. The record of cost of all work performed, including comparative costs with preceding years, together with an accurate daily statement of work performed, is maintained on the card system.

SECTION C. OPERATION AND MAINTENANCE, SEWAGE-DISPOSAL SYSTEM, PUMPING STATIONS, SHOPS, AND YARDS.

The main sewerage pumping station and the Poplar Point and Woodridge pumping stations were in continuous operation throughout the year, and the Rock Creek pumping station, which cares for the sanitary drainage from the upper Potomac areas, was placed in service June 15, 1921. The main station handled 25,000,000,000 gallons of sewage and 424,000,000 gallons of storm water. The Poplar Point station handled 832,000,000 gallons of sewage and the Woodridge station 17,000,000 gallons of sewage during the year. The steam plant at the main sewerage pumping station was substantially reconstructed during the year and improved in efficiency by modernizing the automatic stokers which had been in continuous service without appreciable repairs during 12 years. Repairs and necessary construction work was handled by the blacksmith, machine, and carpenter shops, including a very large part of the installation of the new Rock Creek pumping station.

SECTION D. CONSTRUCTION.

During the year 1.55 miles of main sewers and 6.02 miles of pipe sewers were constructed, about 25 per cent within the old city limits and the balance in suburban areas.

Sewage-disposal system construction was limited to upper Potomac interceptor, which was completed to a point just beyond the Aqueduct Bridge at Thirty-sixth Street, Georgetown.

SECTION E. MAPS, RECORDS, AND DRAFTING.

Work was continued on the 10 feet to 1 inch standard record maps of subsurface surveys and on the 50 feet to 1 inch scale maps showing the sewerage.

A number of detailed drawings for new installations and structures were prepared, maps and records kept carefully posted to date, and the usual plats for extensions, assessments and for contracts prepared.

SECTION F. RECORDS AND ACCOUNTS.

The work of this division covered the preparation of requisitions, detail costs of construction, pay rolls and vouchers, cost-keeping studies and material and equipment accounting, covering the following expenditures from the several appropriations:

SEWERAGE SYSTEM.

Cleaning and repairing.....	\$94,867.89
Sewage pumping service.....	107,979.56
Main and pipe.....	99,685.04
Suburban.....	163,623.90

Assessment and permit.....	\$90,584.53
Permit work.....	821.71
Miscellaneous trust fund deposits.....	5,137.95
Miscellaneous appropriations.....	20,199.02
Condemnation.....	328.95
Outstanding contracts:	
Suburban.....	36,376.10
Assessment and permit.....	9,415.47
Total.....	629,020.12

SEWAGE-DISPOSAL SYSTEM.

Upper Potomac interceptor, 1920.....	\$22,001.08
Upper Potomac interceptor, 1921.....	29,376.17
Total.....	51,377.25
Total expenditures.....	680,397.37

SECTION G. PUBLIC SERVICE CORPORATIONS.

Work of this division involves detailed determination of proper location of all underground construction by the gas, electric, telephone, and telegraph companies and the methodic supervision of the work done under the permits issued therefor, the accurate location of all work and its recording and mapping. The economic and orderly occupation of the public space along predetermined systematic lines is the feature of this work. The work for the year may be summarized as follows:

Permits prepared.....	2,176
New record cards.....	2,176
New jobs inspected and recorded on sheet.....	1,843
Daily average jobs under construction.....	38
New gas mains laid.....	miles 4.78
Electric duct laid.....	do. 89.41
Manholes constructed.....	1,752
Drains from manholes and railroad tracks.....	59
Houses connected with gas mains.....	446
Houses connected for electric light and power.....	2,365
Permit for gasoline and compressed-air pipes.....	10
Vault applications approved.....	11
Vaults inspected, located, and recorded.....	14
Water department connections to sewerage system.....	93

Fourteen standard record maps, 50 feet to 1 inch, were made, five for gas mains, and nine for electric conduits.

The cost to the public service corporations for this work, prorated on the basis of the volume of construction was as follows:

Potomac Electric Power Co.....	\$2,628.44
Chesapeake & Potomac Telephone Co.....	806.92
Washington Gas Light Co.....	355.07
Georgetown Gas Light Co.....	124.83
Washington Railway & Electric Co.....	4.00
Capital Traction Co.....	70.48
Total.....	3,989.74

The following is a summary of the sewerage system and sewage-disposal system to June 30, 1921:

Length of sewerage system.....	miles..	753.88
Main sewers, 150.84 miles; pipe sewers, 603.04 miles.		
Length of sewage-disposal system.....	miles..	36.63
Total length.....	miles..	791.62
Cost of sewerage system.....		\$15,101,797.68
Cost of sewage-disposal system.....		5,970,347.25
Total cost.....		21,072,144.93

ASA E. PHILLIPS,
Sanitary Engineer.

ASSISTANT TO THE ENGINEER COMMISSIONER.

REPORT OF THE ELECTRICAL ENGINEER.

WASHINGTON, D. C., *September 13, 1921.*

SIR: I have the honor to submit the following report of the operations of the electrical department for the fiscal year ended June 30, 1921.

STREET LIGHTING.

The street lighting system has again been little more than barely maintained, there having again been no increase in appropriation. Maintenance difficulties have been somewhat ameliorated and the condition maintenance of the service, particularly as to the gas lighting, has been distinctly improved.

Additions and extensions have necessarily been confined to some of the more pressing demands and needs, in newly occupied unlighted streets, in streets and alleys of enlarged occupancy, and at special points urgently requiring additional safeguarding of traffic. The improvements noted below in Connecticut Avenue and in Massachusetts Avenue were incident to such traffic needs at the intersection of Connecticut Avenue and Calvert Street, and at Sheridan Circle, respectively; those at New Hampshire Avenue and at Louisiana Avenue were incident to new pavement and street improvement work.

The net increase in number of lamps of all kinds is 342, less than $1\frac{1}{4}$ per cent. Of the 533 lamps newly connected (gross), 322, or more than 60 per cent, were either "designation" lamps or the lowest-powered gas or electric. The increase in aggregate candle-power of the street lighting system is from approximately 1,682,350 to approximately 1,707,200, or less than 1.5 per cent, about one-half the annual rate of increment of the population of Washington, based on the 1910 and 1920 United States census, indicating that the lighting of the city, already "on too low a plane," is progressively not improving. Rather than a lengthy discussion of the situation and needs, reference is made to report of 1920, which continues to apply except that the increase of appropriation for the current year, just over $3\frac{1}{2}$ per cent, gives hope of perhaps more than checking the retrogression.

The replacement of many of the street designation signs by other of greater legibility, heretofore referred to, has progressed well, the

substitution being practically complete as to electric lamps and well begun as to the gas.

ARC LIGHTING.

This system has been affected only by the discontinuance of five 4-ampere magnetite arc lamps, in connection with the improvement of Louisiana Avenue, Ninth to Tenth Streets NW. The total number of arc lamps connected June 30, 1921, was 779, as compared with 784 at the close of the preceding year.

INCANDESCENT ELECTRIC LIGHTING.

The number of incandescent electric lamps added is 367, discontinued 86, a net increase of 281. Of these, 94 were of 60 candlepower, in alleys and suburban highways, 13 of 100 candlepower, on overhead wires in suburban highways, 170 of 100 candlepower on the District of Columbia standard design of ornamental posts, and 4 of 250 candlepower on similar posts. The considerable installations of lamps on ornamental posts are 39 on Calvert Street and on Connecticut Avenue NW., from Calvert Street Bridge to Cathedral Avenue; 32 on New Hampshire Avenue NW., Twenty-seventh Street to Washington Circle; 61 on Massachusetts Avenue NW., Dupont Circle to S Street, including Sheridan Circle; 29 on Louisiana Avenue NW., Eighth to Tenth Streets.

The total number of incandescent electric lamps connected June 30, 1921, was 8,406, compared with 8,125 at the close of the preceding year.

MANTLE GAS LIGHTING.

The number of mantle gas lamps added was 123; discontinued 98; a net increase of 25, in single lamps and small groups. The 98 discontinued were replaced by 90 of the 100-candlepower electric incandescent. The total mantle gas lamps connected June 30, 1921, was 10,581, compared with 10,556 at the close of the preceding year.

DESIGNATION LAMPS.

The number of designation lamps added was 43, 35 electric and 8 gas, and the number discontinued was 2 gas, a net increase of 41; the 2 gas discontinued were replaced by 2 of the electric. The total of designation lamps connected June 30, 1921, was 576 (397 gas, 179 electric), compared with 535 (391 gas, 144 electric) at the close of the preceding year.

LIGHTING ALONG STEAM RAILROADS.

The situation with respect to the several suits brought by the District of Columbia against certain railroad companies for repayment for sums expended for the lighting of streets, avenues, etc., adjacent to their several rights of way, remains essentially as reported a year ago. The new trial in the lower court, necessitated by the ruling of the court of appeals, referred to, has not been reached.

SIGNAL SYSTEMS.

The fire-alarm telegraph, police-patrol signal, and the telephone systems have been operated and maintained and each has expanded slightly in the line of natural growth.

Fire-alarm boxes added to the system numbered 22 (20 public and 2 "private"), and 3 "private" boxes were discontinued, a net increase of 19, to a total in service June 30, 1921, of 714. Boxes connected by underground wires were increased by 18 to a total of 613, including 482 on street posts, and boxes connected by overhead wires increased by 1 to a total of 101.

The recommendation of increase in appropriation for a term of years to meet the substandard condition of number of boxes connected for the area covered, a subject of criticism by National Fire Protection Association in its periodical reports on survey of cities, is repeated.

The number of fire alarms received and transmitted through fire-alarm headquarters was 1,795, compared with 1,815 in 1920 and 2,248 in 1919; this includes 21 "additional" alarms (second and third), compared with 22 (second, third, and fourth) in the preceding year. False alarms numbered 145, compared with 151 in preceding year.

The apparatus under contract for expansion of equipment in fire-alarm headquarters had not been received at the close of the year.

The number of police patrol boxes added was 12 (6 connected underground and 6 overhead) and 1 box was discontinued, a net increase of 11, compared with 4 in the preceding year, bringing the total connected June 30, 1921, to 475; of these 378 are connected on underground wires and 97 on overhead.

The number of telephones added on the two switchboards in the jurisdiction of this department was 25 and 16 were discontinued, a net increase of 9, compared with 19 for the preceding year. The total of telephones on District of Columbia system was increased by 36 (compared with 34 of the preceding year) to a total connected June 30, 1921, of 1,427.

The number of cells of storage battery connected on fire-alarm, police-patrol, and local circuits remains unchanged, at 2,174.

The distribution equipment for the composite signal systems (fire alarm, police patrol, and telephone) has been affected by a net increase in underground wires of 1.56 miles of cable, 33.33 miles of conductor, while the overhead wires remain unchanged. Grand total of composite distribution, 6,549 miles of conductor. Certain of the trunk lines are overloaded and appropriation for expansion is urgently required.

POLES AND OVERHEAD WIRES.

The regulation of the erection of poles and the stringing of overhead wires in the streets and other public spaces within the control of the Commissioners has been carried on under the various laws relating thereto and regulations thereunder. The operations of the public utility companies have resulted in an aggregate net increase during the year of 348 poles (289 line and 59 guy), bringing the record total of all electric poles on June 30, 1921, to 20,004 (18,889 line and 1,115 guy). The number of telephone poles in streets and avenues with-

in "the prescribed area" of the act of Congress regulating the use of telephone wires in the District of Columbia approved June 30, 1902, has been increased during the year by 1, compared with a decrease of 7 in the preceding year.

With the growing extension of high-tension supply lines and the natural tendency to limit construction costs in the face of high prices of pole line material, an increase of personnel engaged in inspection on this work is imperative.

ELECTRIC WIRES AND APPARATUS.

In the operations under the act of Congress to regulate electrical wiring in the District of Columbia, approved April 26, 1904, and the regulations thereunder:

The total of permits issued for installation of wires and apparatus on private property was 6,217, compared with 6,099 in the preceding year.

Fees paid the collector of taxes, \$11,626, compared with \$10,596.

Number of inspections recorded, 16,170, compared with 14,965.

These figures show increase above the preceding year, which latter showed phenomenal increases over the next preceding year. Reference is made to the comments in this connection in 1920 report and the statements and recommendations therein repeated.

MISCELLANEOUS WORK.

The service of this department, in cooperation with the municipal architect or for other District departments or divisions, in consulting and counseling, in preparing plans and specifications for and in supervision of electric work, has been considerable, compared with the preceding year. The major subjects were one pumping station, one library, one correctional institution, one hospital, and seven schools.

A representative of this department, jointly with a representative of the serving company, takes monthly readings of all electric meters on municipal service and certifies the vouchers rendered, incidentally checking to insure that service is being rendered under most advantageous schedule available; similarly vouchers for all municipal telephone service are checked for correctness of equipment charges.

PERSONNEL.

My acknowledgment of appreciation is due to the employees of this department for the work accomplished by this office during the year.

Lamps of all kinds in service June 30, 1921, as compared with June 30, 1920.

Kind of lamp.	1920	1921	Kind of lamp.	1920	1921
Mantle gas.....	10,556	10,581	Electric incandescent—Con.		
Electric arc.....			60-candlepower, series.....	3,773	3,917
6.6-ampere magnetite.....	282	282	60-candlepower, multiple....	319	269
4-ampere magnetite.....	502	497	Street designation:		
Electric incandescent:			Gas.....	391	397
250-candlepower, series.....	10	14	Electric.....	144	179
200-candlepower, multiple....	64	64			
100-candlepower, series.....	3,839	4,044	Total.....	20,000	20,342
100-candlepower, multiple....	120	98			

Net increase during year, 342 lamps.

Fire alarms received and transmitted:

Regular box alarms.....	852
Alarms received from telephone stations.....	6
Local alarms.....	916
Second alarms.....	16
Third alarms.....	5
Fourth alarms.....	0
Fifth alarms.....	0
Sixth alarms.....	0
Total.....	1,795
False box alarms.....	112
False local alarms.....	33

Distribution of police patrol boxes June 30, 1921.

Precinct.	Wall boxes.		Booths.	Total.
	Under-ground.	Over-head.		
First.....	38			38
Second.....	27			27
Third.....	50			50
Fourth.....	37	2		39
Fifth.....	44	2		46
Sixth.....	29			29
Seventh.....	23	3		26
Eighth.....	28			28
Ninth.....	38	21		59
Tenth.....	51	11	1	63
Eleventh.....	3	34	1	38
Subprecinct, Tennallytown.....	10	21	1	32
Total.....	¹ 378	94	3	475

¹ Nine of these boxes at following locations are not on posts: 3, Union Station; 1, engineer stables, First and Canal Streets; 1, Takoma Park, watch-box; 1, Treasury Department; 1, Agricultural Department; 1, Department of Justice; 1, Pan-American Union Building.

Number of telephones connected to the District system June 30, 1921.

Offices of the District Building.....	198
Outside offices and institutions.....	102
Residences.....	4
Public schools.....	238
Fire department, private branch exchange.....	59
Police department, private branch exchange.....	65
Water department, private branch exchange.....	44
Franklin School, private branch exchange.....	38
Western High School, private branch exchange.....	18
McKinley Manual Training School, private branch exchange.....	18
James Ormond Wilson Normal School, private branch exchange.....	30
Minor Normal School, private branch exchange.....	13
New Central High School, private branch exchange.....	36
Dunbar High School, private branch exchange.....	21
Public Library, private branch exchange.....	21
Washington Asylum and Jail, private branch exchange.....	24
Sewage pumping station, private branch exchange.....	7
District repair shop, private branch exchange.....	6
House of detention, private branch exchange.....	8
Public patrol service.....	477
Total.....	1,427

There are also 27 portable telephone sets in service, used by the fire department and the electrical department.

Electrical wiring inspections.

Notices received from the inspector of buildings of permits indicating electric wiring:

Building.....	804
Machinery.....	334
Signs.....	59
Total.....	1,197

Permits issued by the electrical department for installations:

Without fee (ordered by District of Columbia, etc.).....	94
Covered by building permits.....	1,083
Not covered by building permits.....	4,928
For temporary work.....	78
Quarterly (maintenance of plants, etc.).....	34
Temporary use of current.....	6,217
Total.....	453
Total.....	6,670

Certificates issued:

Final (including 7 without fee).....	4,716
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	No.	Approximate kilowatts.
Lamps and apparatus installed:		
Lamps, incandescent.....	110,148	5,507
Lamps, arc.....	18	35
Motors.....	535	977
Devices, miscellaneous.....	271	414
Blank outlets.....	160	.....
Subtotal.....	111,132	6,933
Generators.....	3	375
Transformers.....	16	339
Total.....	111,151	7,647

Defective wiring discovered and reported by inspectors, extra of routine inspection work.....	528
Number of notices of defective wiring sent.....	1,617
Requests for inspection (not related to work already under permit).....	43
Miscellaneous jackets (specifications, etc., for District of Columbia work, etc.).....	197
Notices received from the superintendent of licenses, leading to original inspection or periodic (annual) reinspection of theaters, hotels, assembly halls, etc.....	170
Work of inspectors of electric wiring from June 30, 1920, to June 30, 1921:	
Inspections in private buildings (not including theaters and moving-picture theaters).....	15,309
Inspections in municipal buildings.....	208
Inspections in United States Government buildings.....	3
Inspections in theaters (including moving-picture theaters), including reinspections, periodic (annual) and occasional of moving-picture theaters (more frequent periodic inspections being made by the fire marshal), and periodic reinspections (weekly or more frequently if bill changes) of theaters.....	650
Total.....	16,170

Fees paid to the collector of taxes:

For permits.....	\$11,626
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MISCELLANEOUS WORK.

Completed:

Smothers School, estimated cost of wiring.

Deanwood School, specifications for electric lighting fixtures.

Sewage pumping station, Twenty-seventh and K Streets NW., plans and specifications for lighting and power wiring.

Public Library, K Street between Seventh and Ninth Streets NW., plans and specifications for additional lighting, wiring, and fixtures.

Under construction:

Workhouse, Occoquan, Va., specifications for generator, switchboard, and accessories.

Woodridge Langdon School, plans and specifications for lighting, power, and telephone wiring.

Burrville School, plans and specifications for lighting, power, and telephone wiring.

West School addition, plans and specifications for lighting, power, and telephone wiring.

H. D. Cooke School addition, plans and specifications for lighting, power, and telephone wiring.

Psychopathic group, Gallinger Hospital, plans and specifications for lighting, power, and telephone wiring.

In preparation:

New Eastern High School, plans and specifications for lighting, heating, power, and telephone wiring and clock and bell system.

REPORT OF THE WHARF COMMITTEE.

WASHINGTON, *July 15, 1921.*

SIR: The wharf committee has the honor to submit the following report for the fiscal year ended June 30, 1921:

A list of wharf property under lease on June 30, 1921, and a list of wharf property used for Municipal and Federal purposes is filed in this office. All leases that expired during the fiscal year, with the exception of the lease of J. Maury Doye Co., were renewed.

Wharf rentals are fixed by the Commissioners upon the advice of the assessor as to the valuation of the wharf property.

The greatest amount of wharf property lies along the Washington Channel of the Potomac River. The total frontage on the city side of the channel is 9,275 linear feet, of which slightly over one-half is under Federal jurisdiction, and the balance, i. e., the frontage between the south curb line of N Street and Thirteenth Street west, is under the control of the Commissioners of the District of Columbia. The frontage between Thirteenth and Fourteenth Streets is the site of the proposed central heating, lighting, and power plant intended to supply light, heat, and power to governmental buildings. Construction on the plant has not yet been started.

That part of the water front under the control of the Commissioners is occupied by the municipal fish market and wharves, the District of Columbia morgue, harbor police precinct, fire-boat wharf, and District of Columbia workhouse and sand wharves, wood yards, lumber yards, marine railways, freight and excursion boat traffic and other commercial uses.

The wharf property along the Georgetown Channel of the Potomac River is under private control, with the exception of the foot of streets. The foot of only one street is under lease.

Along the Anacostia River front the United States Navy Yard occupies the frontage on the city side from Second to Eleventh Streets. The sewage-pumping station and yard occupies the frontage between

First and Second Streets. The intake of the Capitol power plant is located at the foot of First Street. The only privately leased frontage is that between the building lines of Q Street SE., which is occupied by the Standard Oil Co.

The condition of the water front along the Washington Channel is admittedly a disgrace to the National Capital. It is believed that no other large city in the world having comparable water facilities has such an unsightly and impracticable water front as exists along the Washington Channel. With the exception of the new municipal fish market, the sand and gravel wharf, the Norfolk & Washington steamboat wharf, and wharf No. 6 (now under construction), practically all of the existing bulkhead walls, wharves and buildings used for commercial purposes, were built in a haphazard manner by private individuals or corporations with no regard whatever to uniformity. The existing arrangement of the wharves and slips reduces to a great extent the spaces that would have been available had the water front been developed systematically and in accordance with a well defined plan.

Unsightly structures should be removed from time to time as leases expire and objectionable uses such as coal and wood yards, lumber, boiler, and machinery storage discontinued. A careful inspection was recently made of all structures on Water Street between the Washington Barracks and Fourteenth Street, a report of which is on file in this office. As a result of this inspection, it was found that there are some buildings which can now be removed, and steps are being taken in that direction.

In any contemplated scheme of improvement of the water front, adequate frontage should be reserved for steamboat passenger and freight traffic. At present the following companies are operating steamers from wharves along the Washington Channel: Norfolk & Washington Steamboat Co. (passenger and freight traffic between Old Point Comfort, Portsmouth, and Norfolk, Va., and Washington, D. C.); the Maryland, Delaware & Virginia Railroad Co. (passenger and freight traffic between Baltimore, lower river points, and Washington, D. C.); the Amusement Security Corporation (passenger and freight traffic between river points and Washington, D. C.); Washington-Colonial Beach Co. (excursion traffic between Colonial Beach, Va., and Washington, D. C.); Mount Vernon & Marshall Hall Steamboat Co. (excursion and tourist traffic between Mount Vernon, Va., Marshall Hall, Md., and Washington, D. C.).

In October, 1920, the wharf at the foot of N Street was condemned and removed without cost to the District. A fence has been constructed at this point to protect traffic.

Opportunity is here taken to call attention to the dilapidated and unsightly buildings now housing the harbor police precinct and it is earnestly hoped that funds may be secured to provide suitable quarters for this police precinct as well as for the fireboat.

The wharf committee has kept careful record of the dates on which fire insurance policies expire and has taken the necessary steps to have such policies renewed.

ROLAND M. BRENNAN,
Chairman.

D. E. McCOMB,
RUSSELL DEAN,
Wharf Committee.

The ENGINEER COMMISSIONER.

REPORT OF THE BOARD FOR THE CONDEMNATION OF INSANITARY BUILDINGS.

WASHINGTON, D. C., *October 12, 1921.*

GENTLEMEN: The board for the condemnation of insanitary buildings submits the following report for the year ended June 30, 1921.

Number of board meetings held.....	14
Number of preliminary notices served.....	114
Number of condemnation notices served.....	24
Number of condemnation cards affixed to buildings.....	47
Number of condemnation notices served under section 16 of the Building Code.....	60
Inspections and miscellaneous visits made in connection with the service of notices, repair, and demolition of condemned buildings.....	1, 755
Estimated number of people required to secure other living quarters through action of the board.....	1, 055
Number of cases in court.....	1
Estimated number of tenants and occupants of dilapidated and insanitary buildings benefited by repairs since the creation of the board (May 1, 1906).....	6, 836

The following is a summary of the results of the board's activities:

DURING YEAR ENDED JUNE 30, 1921.

	Exam- ined.	Demol- ished.	Repaired.	No action war- ranted.	Value of repairs.	Pending.
INSANITARY BUILDINGS.						
In streets.....	137	43	34	38	\$66, 130	35
In alleys.....	118	49	22	12	3, 850	22
UNSAFE BUILDINGS.						
In streets.....	65	41	6	5	11, 100	.....
In alleys.....	15	23	2	3	600	.....
Total.....	335	156	64	58	81, 680	57

SINCE BOARD WAS CREATED (MAY 1, 1906.)

Buildings in streets.....	3, 613	1, 689	1, 268	480	\$141, 835	35
Buildings in alleys.....	4, 405	856	644	2, 827	26, 355	22
Total.....	8, 018	2, 545	1, 912	3, 307	168, 190	57

Attention is invited to the fact that the act of September 25, 1914, relating to alley dwellings, as amended by the act of May 23, 1918, makes the use or occupation of such dwellings unlawful after the expiration of one year following the date of the proclamation by the President of the exchange of ratifications of the treaty of peace with Germany. The item of repairs to alley dwellings in the preceding summary consisted mainly of conversion of such dwellings into garages. Such conversion has generally increased the rental value while, at the same time, it bettered living conditions. The figures on demolition and repair (generally conversion) of alley dwellings indicate plainly the effect of the alley dwelling law.

CAREY H. BROWN,
Major, Corps of Engineers, U. S. Army,
Assistant to Engineer Commissioner,

W. C. FOWLER, M. D.,
Health Officer, District of Columbia,

JOHN P. HEALY,
Inspector of Buildings, District of Columbia,
Board for the Condemnation of Insanitary Buildings.

To the COMMISSIONERS OF THE DISTRICT OF COLUMBIA.

REPORT OF SUPERINTENDENT OF THE DISTRICT BUILDING.

WASHINGTON, D. C., *August 16, 1921.*

GENTLEMEN: I herewith submit the annual report on the care of the District Building including the operation of the power plant, wood-work and paint shops, print and blue-print shops, elevator, watch and cleaning forces, and the electrical department, for the fiscal year ended June 30, 1921.

POWER PLANT.

There were consumed 2,155 tons of coal which ran 15.9 per cent ash. We again recommend that we be supplied with "New River" coal, which will reduce our consumption approximately 200 tons per annum. We have been receiving a very poor grade of coal, running from 13 to 19 per cent ash; this together with the high selling price of coal has greatly increased the cost of operation of the power plant. There were 890 cubic yards of ashes removed at a cost of \$801. The total number of kilowatt-hours generated was 429,750; of this amount there were used for lighting 287,960, for operation of the elevators 55,480, and for motors 86,310. The pneumatic-tube system was in operation 2,140 hours, the heating system 4,176 hours, and the ventilating system 854 hours. There were made to the mechanical equipment the following repairs: Relining and rebuilding smoke-consuming arches under two 150-horsepower Sterling boilers, rebuilding stokers under two 150-horsepower Sterling boilers, repairing one 6 by 4 by 6 boiler feed pump which will now give service equal to that of a new one, rewinding one 5 and one 3 horsepower armatures on cold-water system, spotting in slide valve on 1-horsepower Ames engine, and installation of new self-closing cocks in offices and lavatories throughout the building.

ELECTRICAL PLANT.

The electrical plant, in addition to the routine work, changed 75 lighting fixtures from the direct to the semidirect, installed a new tablet board in the boiler room, ran a separate line from switchboard in the engine room and renewed various lines. There were 1,750 feet of governor rope renewed on the passenger elevators at a cost of \$175 and repairs to one of the field coils at a cost of \$50. Electric current used by the various departments for other than lighting was as follows:

	Kilowatt hours.
Police department.....	2,501
Health department.....	58,388
Electrical department.....	541
Fire-alarm headquarters.....	32,084
Total.....	93,514

The high consumption of electric current by some of the departments makes it necessary to recommend that these particular departments include in their estimates an appropriation with which to reimburse the maintenance appropriation for the District Building. During the past three years we have supplied the health department laboratories with 168,405 kilowatt-hours and the fire-alarm head-

quarters with 91,117 kilowatt-hours. The elevator boards and machinery are old, which makes repair parts difficult and expensive to secure. The signal service is also old, requiring constant repairs and giving in return very poor service.

WOODWORK AND PAINT SHOP.

General repairs were made throughout the building by this department. Walls and ceilings were repainted, floors refinished, weather stripping replaced on the east and west revolving doors, window frames renewed and repainted, partition in fourth floor corridor, east, extended for the corporation counsel, and numerous changes and alterations made for the convenience of the various departments.

PRINT SHOP.

This shop completed 358 orders totaling 1,379,990 pieces of printed matter at a cost of \$8,101.73 for the departments of the District government; in addition to this there were numerous orders for pads, calendars, etc., executed, I believe, to the entire satisfaction of the departments.

BLUE-PRINT AND PHOTOGRAPH SHOP.

There were completed 48,582 square feet of blue printing at a cost of \$2,657.45, and 1,600 photographs at a cost of \$660.62. There was purchased and installed a Pease Peerless blue printer at a cost of \$700 to replace one which had been in use for 13 years and which was no longer serviceable.

The District Building was completed in 1908, since which time the original departments of the District government have grown and new departments have been created. This has resulted in congestion throughout the building; corridor rooms have been built, wherever possible, to help relieve this, but many departments are handicapped because of insufficient floor space for the conduct of their business. Additional floor space should be provided either by building an addition to the District Building or the acquisition of adjacent property.

F. S. BESSON,
Major, Corps of Engrs., United States Army,
Superintendent.

The COMMISSIONERS OF THE DISTRICT OF COLUMBIA
(Through the Engineer Commissioner).



